

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES—	Page.	BRITISH MEDICAL ASSOCIATION NEWS—	Page.
Avicenna, by W. S. Dawson	533	Special Group on Aviation Medicine	551
Barotrauma, by Noel E. H. Box, M.B., B.S., F.R.C.S., D.L.O., F.R.A.C.S.	538	OUT OF THE PAST	552
Succinylcholine Chloride: An Ultra-Short-Acting Relaxant, by A. P. Balthasar, D.A., and C. A. Sara, D.A.	540	CORRESPONDENCE—	
An Additional Note on a Simple Method for Estimation of 17-Ketosteroids in Urine, by Vera I. Krieger, D.Sc.	542	The Antibody Titre in Maternal and Infant's Serum as an Indication for Treatment in Haemolytic Diseases of the Newborn	552
REVIEWS—		Surgery of the Adrenal Glands	553
The Clinical Use of Radioactive Isotopes	543	Dermatitis Apparently Caused by a Staphylinid Beetle in Australia	553
Recent Advances in Bacteriology	544	The Movable Eye Implant: A Description of the Implant Technique Using the Cutler-Hamblin Prosthesis	553
BOOKS RECEIVED	544	NAVAL, MILITARY AND AIR FORCE—	
LEADING ARTICLES—		Appointments	554
Kwashiorkor	545	POST-GRADUATE WORK—	
CURRENT COMMENT—		The Post-Graduate Committee in Medicine in the University of Sydney	555
Infective Hepatitis and Cirrhosis of the Liver	546	NOMINATIONS AND ELECTIONS	555
Narcotics in Pre-Anæsthetic Medication	547	DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA	555
ABSTRACTS FROM MEDICAL LITERATURE—		NOTICE—	
Radiology	548	Post-Graduate Golf Match	556
Physical Therapy	548	DIARY FOR THE MONTH	556
SPECIAL ARTICLES FOR THE CLINICIAN—		MEDICAL APPOINTMENTS: IMPORTANT NOTICE	556
XVI. Conjunctivitis	550	EDITORIAL NOTICES	556

AVICENNA.

By W. S. DAWSON,
Sydney.

To those of us who cannot look forward to 1980 it comes as a pleasant surprise to learn that we should commemorate forthwith the millennium of the birth of Avicenna, hitherto stated to have occurred in A.D. 980. According to Professor A. J. Arberry,⁽¹⁾ failure to make allowance for the shorter Mohammedan year has resulted in the perpetuation of an error. Since Avicenna was born in the three-hundred-and-seventieth year of the Hegira (flight of Mohammed, A.D. 622), 1951 represents the millenary in the Christian calendar. Avicenna, or Abū 'Alī al-Husain ibn 'Abdallāh ibn Sīnā, was born in Afshena (or Balkh, according to Thomas⁽²⁾) in the province of Bokhara. To the capital of that name his father, a government official, was transferred in Avicenna's early childhood. In order to appreciate the cultural opportunities which were available to Avicenna's exceptional abilities, it is necessary to review some of the Arabian history of that period.

Islamic Culture.

The teachings of Mohammed and his followers had fallen on receptive ears in the Middle East, where by the sixth century Christianity and Judaism had both staled and ceased to make any progress. Arabia became, according to H. G. Wells,⁽³⁾ "a centre of faith and will", and the cohesive effects of a new conception of deity infused its people with confidence and ambition, which led during the next few centuries not only to military conquests, but also to a renaissance of science, philosophy and literature.

The centre of power shifted to Baghdad; but after the death of Harun-al-Rashid (A.D. 786-809) the provinces of the Arabian caliphate became independent and developed their cultures with more individuality. Baghdad, as well as being the seat of government, had become an enlightened

and progressive source of culture. A large hospital had been established early in the ninth century, science, medicine and art were encouraged, and Greek works especially were translated into Arabic. Honein, a Christian Arab born A.D. 809 (the "Prince of Translators"), translated the works of Hippocrates, of Aristotle and of Galen. His "Isagoge", a work which was carefully studied by many generations of physicians, was a translation of Galen's "Microtegni". The Nestorians, a sect who had broken away from the Christians of the eastern Roman Empire, found that the teaching of Greek culture and learning encouraged the reception of their own religious doctrines and were responsible for the translation into Syriac of important Greek works. The head of the Nestorian Church was at Edessa (now Urfa in southern Turkey); but Nestorian missionaries penetrated through Arabia into India and China. There was a Nestorian university with a hospital at Jondisapur, about 100 miles east of Basra, which became a meeting place for students from Greece, Syria, India and China.

The large province of Khorasan, to the south-east of the Caspian Sea, was under the rule of the Samanids, who had become independent of the Caliphate of Baghdad early in the tenth century. In accordance with their progressive policy the Samanids had accumulated a large library at Bokhara.

Avicenna's Education.

In an autobiography Avicenna acknowledged the teachings of itinerant scholars, who lectured on mathematics, astronomy, astrology, logic and philosophy, and often added to their livelihood by treating disease. He claimed to have known the Koran and much Arabic poetry by heart by the time he was ten years old, and a few years later he had mastered logic, geometry and Ptolemy's great treatise on astronomy, the "Almagest" (Thatcher and Walker⁽⁴⁾). By the time he was sixteen years old he had suggested some new forms of treatment for disease. He had read the "Metaphysics" of Aristotle forty times before

he was eighteen years old; but in spite of intense study and stimulation by many cups of wine, this great work eluded his comprehension. He often retired to the mosque in order to pray for enlightenment. Sometimes the solution to some philosophical problem came to him in a dream. Finally, he gained full insight after reading a small commentary on Aristotle which he picked up at a bookstall. Avicenna's great opportunity came when he was granted access to the library of the Samanids as a reward for his successful treatment of one of the family.

seller with the rank of vizier. Soon afterwards there was a revolt against the Amir and a demand for the death of Avicenna, who went into hiding, suffered a severe illness, and was later restored to his positions. Meanwhile he continued at the "Canon" and his other major work, the "Sanatio". Shams Addaula died and the new Amir sent Avicenna to prison, whence the notorious lover of "wine, women and song" escaped in the disguise of a Sufi ascetic and found asylum in the house of one Abu Ghalib, a pharmacist, until he finally got away to Isfahan, accom-



FIGURE I.
Portrait of Avicenna.

When the great library was set alight by the soldiers of the victorious Mahmud of Ghazna a few years later, the story got about that Avicenna had himself sought to destroy the source of all his knowledge.

Wanderings of Avicenna.

Avicenna continued to live in Bokhara until the Samanid dynasty gave place to Ilek-Khan, Prince of Turkestan, in A.D. 999, when he wandered through Khiva, Nishapur, Merv and Khorasan, the capital of the province of that name, then on to Gurgan on the southern border of the Caspian Sea, where he settled for a while as teacher and physician, and began to work on his "Canon". He then moved on to Rayy, the home of Rhazes, near Teheran, where he is said to have written some thirty shorter works on a variety of subjects. Political disturbances drove him on to Hamadan, where he obtained the patronage of the Amir Shams Addaula and was appointed personal physician and coun-



FIGURE II.
Map to illustrate the wanderings of Avicenna.

panied by a brother, a favourite pupil and two slaves. For the next few years he accompanied Abu Ya'far Ala Addaula on several campaigns in the capacity of physician and adviser, until he was overcome by a colic which he attempted to treat in such drastic measure with his polypharmacy that he reduced himself to a state of profound exhaustion. After several relapses he gave up hope of recovery, took to his bed, gave away his estate in remorse for the sins of his flesh, and died in the year 1037 (Arberry⁽¹⁾) at the age of fifty-eight years.

Avicenna's Tomb.

The tomb of Avicenna remains outside the city of Hamadan. Just before the first World War Sir William Osler⁽²⁾ who had received an illuminated manuscript of the "Canon" copied in A.D. 1360, endeavoured through a Persian physician, Dr. S'eed, to have the tomb restored. Dr. S'eed had reported as follows: "The date of 1294 A.H. at the top is the date of renewing the place by the daughter of the Shah. The dome also was built by the Princess but is decaying and needs attention. Inside it is black with the smoke of wood opium and hashish used by the Dervishes who take shelter there." The tomb appears to have been sought also up to recent years as a shrine for the cure of disease. In 1919, just before his own death, Osler made another unsuccessful attempt to have the tomb put in repair, but this has since been done (Elgood⁽³⁾).

Avicenna's Writings.

Avicenna is credited with some hundred works on theology, philosophy, logic, metaphysics, astronomy, physics, alchemy, mathematics and music, most of these being short treatises. He also wrote poems, some of them just "pretty wine songs", but of one, a "Hymn to the Deity", Osler⁽⁴⁾ said that it might have been written by Plato. His major works are "The Canon" and "The Sanatio" (Al-Shifa), an encyclopaedia of philosophy and science. Other works of medical interest are his "*Medicamenta cordialia*", "*Canticum de medicina*", and the "*Tractatus de syrupo acetoso*". Avicenna's knowledge of drugs was extensive, based on Greek and Latin sources, with additions from China and India. Chaucer⁽⁵⁾ wrote:

But certes, I suppose that Avicen
Wroot never in no canon, ne in no fen,
Mo wonders signes of empoisoning
Than hadde thise wreeches two, er hir ending.

"Though dead", Osler¹⁷ wrote, "Avicenna and Averroes still speak, not only in the Arabian signs which we use, but in the combinations and multiplicity of the constituents of too many of our prescriptions."

could not rise again. The physician ordered the removal of her veil and headdress thinking to shame her into activity. This was of no avail. He then ordered another attendant to strip off the girl's trousers, whereupon such a warmth perfused her limbs and dispelled the



FIGURE III.

Illuminated illustration from a Hebrew manuscript of Avicenna (fifteenth century), in the Bologna Library.

Among some other medical works mentioned by Elgood¹⁸ are "The Laws", "Medical Definitions", a treatise on cardiac drugs, a work on colic, and a book entitled "Origin and Return", which contains some observations on mental phenomena, including the following story.

A physician was summoned to the Harem to deal with one of the handmaids who had placed a dish of food on the ground before the King and then protested that she

thick rheum, that she quickly regained her upright posture.

"The Canon."

"The Canon" is divided into five books, physiology, anatomy, pathology and hygiene being covered in the first two and therapeutics in the third and fourth, while the fifth is devoted to the preparation and composition of

o
o
m
t
o
m
o
a
g
o
s
a
P
A
f
r
a
i
v
t
t
f
o
a
a
a
H
V
a
n
c
tr
a
e
a
a
A
st
a
b
c
r
g
tl
p
b
lu
or
b
th
p
m
pl
p
b
pl
al
a
as
ly
in

drugs. Anatomical descriptions are included in some 95 chapters, mostly derived from Galen, since dissection of the human body was contrary to Mohammedan precepts. The following is a summary of the more notable observations and teachings in this work.

Loss of sensibility and movement in apoplexy was said to follow occlusion within the brain caused by (i) plethora or congestion in the meninges or substance of the brain, or (ii) transmission of plethoric substances to the brain, or (iii) contraction of vessels of the brain against noxious matter, causing anæmia. Venesection was used in treatment.

Various types of hemiplegia and other paralyses were described, especially of the ocular muscles. Avicenna recognized six muscles to each eyeball and the common insertion of four at the back of the orbit, and it appears that he also noted changes in the size of the pupils. He distinguished between facial paralyses of central and peripheral origin.

Inflammation of the meninges of the brain—acute *serdms*—was regarded as different from simple delirium and was stated to end in general loss of sensation, paralysis of the tongue and death from asphyxia. Avicenna is accordingly credited with having been the first not only to describe acute meningitis, but also to have recognized meningeal irritation in acute pneumonia. He also stated that tumours could occur both in the brain and in the bones, contrary to the opinion of earlier medical writers.

Avicenna distinguished pleurisy from other inflammations within the thoracic cavity.

Pyloric stenosis and gastric ulcer were both described, the latter to be suspected by persistent pain unrelieved by food or other means. Avicenna explained that the coils of intestines allowed time for the absorption of nutriment and separation of waste matter in food, an observation already made by Aristotle. Palpation of the edge of the liver could give a clue to the condition of that organ. Various forms of jaundice, inflammation of the gall-bladder and hepatic abscess are described in "The Canon".

Avicenna described various uterine tumours and displacements and prolapse, and recognized the gravity of cervical cancer. Difficult birth could be caused by small hips, and traction on a noose passed round the fœtus was used to assist delivery.

Tracheotomy, the opening of abscesses (including empyema) by cautery or knife, lithotomy, ligature of piles, and arrest of hæmorrhage by ligatures, tampons or caustics are some of the surgical procedures described. Since Arabian physicians, forbidden to dissect, could at least study the skeleton, they were skilful in treating fractures and in reducing dislocations.

The section entitled "*De morbis mentis*" is said to have been regarded as one of the most authoritative during the centuries that "The Canon" retained its prestige. Avicenna recognized five faculties: (i) a general faculty of intelligence, situated in the forepart of the brain; (ii) imagination; (iii) animal propensities; (iv) memory; (v) comprehension. Following Galen, he postulated a humoral basis for mental disorders. Abnormal perception and hallucinations were held to be due to alterations in the flow or composition of humours in the anterior part of the brain; reduction of intellect was referred to disorders in the middle ventricles, and reduction of memory to the posterior ventricles. With regard to clinical varieties of mental disorders, Avicenna described the following: phrenitis or delirium in fevers; mania, in which the patient might be aggressive; melancholia with solitariness, brooding and despair; lethargy due to accumulation of phlegm in the brain; incubus or nightmare (Arabic, *alcaidum*) often as a prodrome to mania, epilepsy or apoplexy; a pathic disorder, referred to later by Juvenal as *molities* or effeminacy in young men; *amor vesanus*; lycanthropy (named after King Lycaon of Arcadia, changed into a wolf as a punishment for impiety).

It is recorded that Avicenna was called to see a young man of Gurgan who was suffering from a mysterious disorder. Suspecting this to be a case of *amor vesanus*, Avicenna kept his fingers on the patient's pulse while someone recited the names of neighbouring towns and villages, then the streets in a certain township, finally the inhabitants of a certain street, when the patient's pulse quickened at the name of a damsel who was promptly called to the bedside. The sequel was a quick recovery and a happy marriage.

The emotional quickening of the pulse had already been noted by Galen in his "*De præsentatione ex pulsibus*" and had been made use of by Celsus in the case of a Roman lady who was the victim of a hopeless passion for a certain gladiator.

Avicenna's handling of a case of lycanthropy was equally successful.

He was consulted about a prince who imagined himself to be a cow and refused to eat. After listening to the story he sent a message to the prince bidding him expect a butcher. A little later Avicenna went to see the patient, brandishing a knife. After feeling the patient all over Avicenna declared him to be too lean for slaughter and prescribed a fattening diet. The prince accordingly began to eat, gave up mooing like a cow and made a good recovery.

One of Avicenna's more celebrated aphorisms is "*Circa initia diligentissima curanda est melancholia*"—with due care in its early stages melancholia is curable. Much importance was attached to therapeutic occupation.

With his outgoing and vigorous personality and worldly wisdom we may assume that no small part of Avicenna's reputation as a physician rested on his success with maladies of emotional origin.

How came it not only that Chaucer's physician "well knew", amongst many other medical writers, "Serapion, Rasis and Avicenna", but that "The Canon" was read in the medical schools of Montpellier and Louvain up to 1650? The appeal to students of this historical work lay in its dogmatic and logical exposition, in the orderly presentation of carefully selected material from earlier literature, and in the detailed directions regarding treatment—dietetic, pharmacological, manipulative and general.

Neuburger⁽¹⁾ wrote as follows.

The "Canon" stands for the epitome of all precedent development, the final codification of all Græco-Arabic medicine. It is a hierarchy of laws liberally illustrated by facts which so ingeniously rule and are subject to one another, stay and uphold one another, that admiration is compelled for the sagacity of the great organizer who, with unparalleled power of systematization, collecting his material from all sources, constructed so imposing an edifice of fallacy. Avicenna, according to his lights, imparted to contemporary medical science the appearance of almost mathematical accuracy, whilst the art of therapeutics, although empiricism did not wholly lack recognition, was deduced as a logical sequence from theoretical (Galenic and Aristotelian) premises. Is it, therefore, matter for surprise that the majority of investigators and practitioners should have fallen under the spell of this consummation of formalism, and should have regarded the "Canon" as an infallible oracle, the more so in that the logical construction was impeccable and the premises, in the light of contemporary conceptions, passed for incontrovertible axioms?

According to Clifford Alibutt,⁽²⁾ "Medicine [in the fifteenth century] was still an Arabist convention, a digest of Rhazes and Avicenna; and the physician in no touch with Nature was wont to lecture from the desk only, and to prescribe for his most distinguished patients even without seeing them. He taught abstractions and he treated abstractions."

The authority of "The Canon" survived until Vesalius (1514 to 1564) reviewed the traditional teachings on anatomy in the light of his own researches, and others began to inquire for themselves. Osler, who might have named an even more notable exception, described "The Canon" as the most famous text-book ever written. But Avenzoar (1094 to 1160) regarded it as fit only for waste paper. Paracelsus (1493 to 1541) cast it into the flames

at his first public lecture at Basle in 1526, proclaiming "It is no longer fit for use. What is living and true the fire cannot burn", while Albrecht von Haller (1708 to 1777) termed it "*methodica inanitas*". Had the clinical records which Avicenna had intended to include in his work not been lost before the completion of "The Canon", it is possible that the judgement of posterity might have been less severe.

Editions of "The Canon".—Gerard of Cremona (A.D. 1114 to 1187), the "Father of Translators", was responsible for the majority of the Latin versions of "The Canon", which were printed first in Strassburg and Milan in 1473, in Padua in 1476, and in Venice in 1482. Both Latin and Hebrew translations appeared in Naples in 1491. "The Canon" was printed in Rome in the original Arabic in 1593. The Hebrew version was printed again by the Giunta Press in 1608, with plates. The copy in the Gordon Craig Library, now in the possession of the Royal Australasian College of Surgeons, Melbourne, is the Latin version of Gerard printed in Padua by Johannes Herborn, dated November 6, 1479, with a printed surface of 11.5 by 7.25 inches. Neuburger⁽¹⁾ states that there are about 30 Latin editions, and Osler⁽²⁾ refers to the existence of "Innumerable manuscripts". The Arabic original is being edited in Egypt for publication as a millenary memorial (Arberry⁽³⁾).

The Personality of Avicenna.

Quite apart from his lofty achievements in the transmission of knowledge, Avicenna surely deserves commemoration for his colourful and vital personality. This man of the world and counsellor of princes, himself *el-scheich Aragis*—Prince of Physicians—so devoted to scholarly tasks in the face of great obstacles, had a deeply religious side and revealed himself in his philosophical writings and poetry also as something of a mystic as well as a romantic. He lived his fifty-eight years to the full, this "versatile, light-hearted, boastful and pleasure-loving" sage (Wallace and Thatcher⁽⁴⁾). After a day fully occupied with affairs of state and with medical practice he would spend the evening dictating his works and lecturing, and would then repair to a tavern with his students to carouse and be entertained by plays and music. It was said of him, according to his friend and biographer, Juzjani, that all his philosophy could not make him moral, nor all his physics teach him to preserve his health.

Acknowledgements.

I am indebted to Dr. K. S. Macarthur Brown, lecturer on the history of medicine in the University of Sydney, for advice and for several references, also to Mr. H. G. Wheeler, secretary of the Royal Australasian College of Surgeons, and to Professor K. F. Russell, of the University of Melbourne, for permission to reproduce the page of "The Canon" (Figure IV), which was photographed in Professor Russell's department. Figures I and III have been taken from Osler's "Evolution of Modern Medicine", by kind permission of the Yale University Press.

References.

- (1) Arberry, A. J., *The Listener*, December 13, 1951.
- (2) Thomas, B., "The Arabs", London, 1937.
- (3) Wells, H. G., "Outline of History", London, 1930.
- (4) Wallace, W., and Thatcher, G. W., "Avicenna", *Encyclopedia Britannica*, Thirteenth Edition, 1926.
- (5) Osler, W., "Evolution of Modern Medicine", New Haven, 1921.
- (6) Elgood, C., "Medical History of Persia", Cambridge, 1951.
- (7) Chaucer, Geoffrey, "Canterbury Tales", Skeat's Edition, London, 1949.
- (8) Osler, W., "An Address on the Treatment of Disease", *British Medical Journal*, Volume II, 1909, page 185.
- (9) Neuburger, M., "History of Medicine", Volume I, translated by E. Playfair, London, 1910.
- (10) Allbutt, C., "Greek Medicine in Rome", London, 1921.

BAROTRAUMA.¹

By NOEL E. H. BOX, M.B., B.S., F.R.C.S. (Edinburgh),
D.L.O. (England), F.R.A.C.S.,
Melbourne.

OTITIC BAROTRAUMA.

OTITIC BAROTRAUMA is a traumatic aural condition resulting from a difference between the intratympanic pressure and that of the surrounding atmosphere. It occurs in flight and in the decompression chamber, from the failure of the Eustachian tube to ventilate the middle ear for a variety of reasons.

The changes of altitude met with in flight expose the subject to great variations in atmospheric pressure. The atmospheric pressure at sea level is 14 pounds to the square inch; at 18,000 feet approximately it is seven pounds to the square inch; at 40,000 feet it is approximately two and a half pounds to the square inch.

It is clear that, unless air can pass freely to and from the tympanic cavity, a considerable pressure differential can occur in the normal subject. The Eustachian tube—the only communication between the tympanic cavity and the exterior—is, during rest, not an open tube.

The Eustachian tube consists of two portions: (i) an outer bony portion, 12 millimetres in length, communicating with the tympanic cavity; (ii) an inner membranous-cartilaginous portion, 24 millimetres in length, communicating with the naso-pharynx. The tube is lined with ciliated cuboidal epithelium, and a number of discrete lymphoid nodules are present in the membranous-cartilaginous portion. The bony portion is narrowest at its junction with the membranous-cartilaginous portion, and is not compressible. The membranous-cartilaginous portion has a partial skeleton of cartilage. A section shows the cartilaginous support to be C-shaped, with the open portion below. Below, the wall is entirely membranous. This portion of the tube is compressible. This portion is, at rest, in a collapsed condition, the lumen being closed. The tensor muscles of the palate have part of their origin from the lower membranous portion, and muscular contraction opens the tube. The tympanic cavity is situated in the temporal bone, and a thin membranous wall divides it from the external atmosphere—namely, the drumhead. Two small membranous walls separate it from the inner ear—namely, the round and oval windows.

During ascent the normal Eustachian tube opens spontaneously. A pressure differential of about 14 millimetres of mercury (about one-quarter of a pound to the square inch) is sufficient to open the tube and allow air to pass. The pressure differential is not completely levelled. A slight residual pressure, which has been calculated at approximately 3.5 millimetres of mercury, remains. As the altitude increases, the tubes open spontaneously every few hundred feet and allow the exit of air under pressure. This has been calculated as between 400 and 500 feet after the first 500 feet.

During descent the tubes do not open spontaneously. It is necessary to contract the tensor muscles of the palate to allow air to enter the tympanic cavity. Swallowing, yawning, shouting *et cetera* serve this purpose. The technique of autoinflation is particularly effective as, by this means, air is actually forced into the tympanic cavity. The subject closes his nostrils with his fingers, compresses the air in the naso-pharynx and swallows whilst so doing.

Should no effort be made to open the Eustachian tube, and the pressure differential rise to 80 or 90 millimetres of mercury, the compressible portion of the tube is so squeezed by the external pressure that muscular action is no longer capable of opening it, unless the differential pressure is lowered by a return to a higher altitude. A decidedly lower pressure than 80 millimetres of mercury has had this effect on odd occasions.

¹Read at a meeting of the Special Group on Aviation Medicine (British Medical Association) on October 30, 1951.

Symptomatology.

One or both ears may be affected. The symptoms caused are pain, deafness, inability to clear the ears, tinnitus and occasionally vertigo.

All the symptoms are not necessarily present, and the severity of the symptoms varies according to the pressure differential, not merely with the loss of altitude in terms of distance. It is obvious that the pressure differential caused by a descent from 30,000 feet to 20,000 feet will be very much less than that caused by a descent from 10,000 feet to sea level.

Rapidity of descent is not a cause of the syndrome, though, should the tube be blocked, the onset of symptoms will be rapid and perhaps the condition exaggerated by the rapid onset. The importance of a rapid descent is that a subject can easily be caught unaware, and a pressure differential, sufficiently great to lock the tube, is built up by the time he realizes that he is in trouble.

Pain.

The onset of pain may be gradual or sudden, and the degree from mild discomfort to unbearable agony. It is relieved by equalization of the pressures. It is usually the result of descent, but when a blocked tube is present it can be caused by ascent. A delayed form is occasionally seen, occurring several hours after descent.

Deafness.

Deafness is usually of the conduction type. Rarely nerve deafness has occurred in both acute and chronic cases. In the former, there has probably been some vascular damage in the labyrinth; in the latter, the possibility of noise trauma enters into the aetiology.

Clinical Appearance of the Drum.

The clinical appearance of the drum may be as follows: (i) The drumhead is invaginated to varying degrees, the handle of the malleus rises to the horizontal position and foreshortening is present. (ii) The drumhead is congested along the handle of the malleus and the anterior and posterior folds. (iii) Interstitial haemorrhages into the drumhead are small and bright red, single or multiple. (iv) When rupture of the drumhead occurs, it usually causes a sudden, violent pain, but is occasionally not a painful accident. A thin, transparent scar may give way without much disturbance. (v) Effusions into the tympanum are shown by the presence of bubbles; they are best seen with a pneumatic speculum. This has been proved radiologically. (vi) Hematotympanum—a blue, bulging drum—is present.

Causes.

The following are the causes of barotrauma. (i) Ignorance; no attempt is made to open the Eustachian tubes and clear the ears during descent. (ii) Failure to "clear the ears" from sleep or coma, or through being caught unawares by a sudden descent. (iii) Upper respiratory tract congestion from infection or allergy. (iv) An otitic barotrauma that has not subsided. (v) Anatomical abnormalities of the Eustachian tubes. It is thought that this is often due to hypertrophy of lymphoid tissue in the tube, but frequently no abnormalities or pathological condition of the upper respiratory passages can be demonstrated. (vi) Dental malocclusion, which is sometimes associated with Eustachian obstruction. It has been attributed to pressure of the mandibular condyle on the tube, and an extraordinary series of aural symptoms have been labelled as "Costen's syndrome". Aural symptoms from "closed bite" are most commonly seen in civil practice in elderly subjects who have long refused to wear dentures. There is a great deal of doubt as to whether the pressure of the condyle is the effective mechanism.

A chronic form of barotrauma occurs in people who repeatedly fly with Eustachian insufficiency. In the early stages, symptoms may be noticeable during and after flight. Later, small variations of pressure cause a disproportionate amount of discomfort, and the ears may reach the stage

at which some discomfort is continuous. The appearances are those of subacute or chronic infection of the middle ear of catarrhal type, and the history indicates the diagnosis.

Prophylaxis and Treatment.

The affected ear should be inflated as soon as possible. Politization or catheterization may be required.

A great deal of care is taken in the selection of candidates for air crew. A candidate must demonstrate his ability to autoinflate both ears. Any appreciable degree of aural or nasal abnormality of a chronic nature will disqualify him.

Trial flights in aircraft and compression chambers are largely used as an educational experience, and as a check on the capability of trainees to cope with ascent and descent.

Service crew members are considered unfit to fly during the active phase of an upper respiratory infection.

A subject who has a permanent type of perforation of a drumhead will not suffer from barotrauma in the affected ear.

A candidate's word that autoinflation has been successful is not reliable. If the drum is seen to move with the act, there is no doubt that the tube is patent. If a typical sound is heard with the auscultation tube, there is little doubt. If the sound is atypical or absent, the tube should not be regarded as patent.

Upper respiratory tract disease should be corrected if the condition *per se* indicates this. There is certainly no guarantee that a patent Eustachian tube will result.

Malocclusions can sometimes be dealt with by a raised dental plate, if a plate is worn, or by an overlying plate if none is worn. This will be a matter for a dentist experienced in this work, and is a compromise between efficiency and discomfort. In service personnel it was often successful in selected candidates.

A great many persistent sufferers in the Royal Air Force and the United States Air Force have been treated by the application of radium to the tubal orifice in the nasopharynx. Variable results have been reported. Dickson has described a deep X-ray therapy technique.

If a subject can regularly autoinflate his ears on the ground, but has trouble in clearing the ears whilst flying, it is probable that swallowing alone is inefficient in his case. He should try autoinflation at the first sign of a descent, and practise it every few hundred feet during descent. It should be noted that routine examination of air crew candidates showed that many apparently normal men can autoinflate their ears only with practice.

Commercial planes descend slowly (a descent of 300 feet per minute is considered satisfactory), and as the saliva is swallowed involuntarily every minute or two, a harmful pressure differential does not occur in the normal person. The sucking of sweets induces a flow of saliva, and swallowing is carried out much more frequently.

Sleeping subjects should be awakened before descent.

Pressurization.

A cabin pressure of 6.55 pounds to the square inch, if controlled during ascent and descent, would give a ceiling of about 18,000 feet without an aural hazard.

Frequency.

No reliable statistics are at hand. Under service conditions, symptoms are often not notified for fear of the subject's being grounded, and exaggeration of symptoms by "wavers" was not unknown. Dickson tested 1000 cadets; 89 failed at least in three tests, and only seven failed in all tests.

I think it would be safe to say that a great deal of discomfort from otitic barotrauma in commercial flight is caused only to a very small proportion of people flown. However, such cases are frequently encountered, and sometimes the failure to seek immediate treatment has led to considerable aural damage.

SINUS BAROTRAUMA.

As with the otitic barotrauma, sinus barotrauma is more likely to come on and the pain is more pronounced during descent. In congestive nasal conditions, the "vacuum" type of headache resulting from an obstructed ostium, with a sinus clear on transillumination and X-ray examination, is seen frequently.

There is a great variation in normal anatomy, and subjects with a free communication fail to suffer from this symptom, even when gross pathology is present. The frontal sinus alone communicates with a tube, and a tube is more readily blocked than an ostium, and harder to clear when blocked.

Dickson's figure for 1000 cadets was 13 cases of sinus barotrauma. A "Benzedrine" type of inhaler is helpful, if it is used shortly before descent.

DENTAL BAROTRAUMA.

Dental barotrauma usually occurs during ascent, with relief on descent.

Molars particularly are affected, and it occurs most frequently in recently filled teeth. It comes on, on the average, at an altitude of about 5000 feet.

If a small collection of gas is confined in the dental area, heat applied to the region will cause pain, whilst cold (unlike caries) applied to the area causes no pain. Such teeth are likely to be affected by barotrauma. The treatment is dental.

SUCCINYLCHOLINE CHLORIDE: AN ULTRA-SHORT-ACTING RELAXANT.

By A. P. BALTHASAR, D.A., and C. A. SARA, D.A.,
Sydney.

RECENTLY the use of two new muscle-relaxing agents has been described in the literature. One called tachycurine or 3261S has been reported by Ottolenghi; the other, succinylcholine iodide, has been described by Thesleff and Von Dardel, of Stockholm. This report, however, concerns the use of succinylcholine chloride. The only reference available to us concerning the use of the chloride is a short statement by Myerhoffer, of Vienna, who reports that the chloride is more stable than the iodide. A small supply of the drug was made available and we used it clinically in cases in which the age range was sixty-seven years to six years.

The agent is presented as "Scoline" in ampoules containing two millilitres of a clear fluid, in which there are 100 milligrammes of the active drug succinylcholine chloride.

Physical Properties.

Both succinylcholine iodide and succinylcholine chloride are stated to be unstable in alkaline solution. Experiments were conducted to determine the stability of succinylcholine chloride in alkaline solution, thiopentone being used as a medium. (Any future reference to thiopentone in this article means a 5% solution.)

It was found that the chloride with a trace of alkali produced a flocculent white precipitate. This redissolves as long as the ratio of thiopentone to succinylcholine chloride exceeds 2:1.

The stability and activity of the redissolved precipitate were ascertained in the following manner. Clear solutions of succinylcholine chloride mixed with thiopentone were left for varying periods and injected intravenously. It was found that after a time interval of one half-hour the precipitate reappeared and injection of this mixture was no longer active, the effect produced being merely that of the thiopentone.

However, if the agents are mixed within the proportions described above and injected, say, in ten minutes, the succinylcholine chloride is completely active.

Pharmacology.

The solution in the ampoules has a pH of 2.9, yet when injected alone into tissues or veins it is apparently non-irritant.

Although it has been reported that it causes no production of histamine, we found that with skin test doses a small flare occurred of less size than that seen with d-tubocurarine. There was no flare when decamethonium iodide or distilled water was used as a control. At the site of injection there was no evidence of any permanent irritation.

Subcutaneous injection of a standard dose for weight was performed to determine whether there would be any irritation of the tissues, if subsequently with its clinical use an extravenous injection was inadvertently made. It was observed that absorption occurred within three to five minutes, producing the usual effects of the drug. However, these were attenuated, the subject first complaining of tightness in the jaw muscles and then of general muscular weakness.

In one subject sitting in a chair the muscular weakness was so pronounced and the onset so rapid that syncope resulted.

The duration of this effect produced by subcutaneous injection lasted fifteen to twenty minutes and there was no irritation of the tissues.

Intravenously the drug first produced muscle fibrillation of the face, evident in most cases within fifteen seconds. The non-coordinated muscular contractions are pronounced, and when they are observed in the upper extremities some movements of the limbs may occur. The whole excitation process takes about fifteen seconds. The contractions appear last in the lower extremities. By this time the muscles of the head and neck are usually completely relaxed, and the march of relaxation ensues in the same order as the contractions.

In every case in which ordinary clinical dosage was used intravenously, apnoea occurred. The duration varied with the amount of drug used, but in all instances spontaneous respiration had returned by two minutes thirty seconds. The respiratory amplitude rapidly returned to normal in another one to two minutes.

An attempt was made to determine the actual end point when the paralysing effect on the muscular system had disappeared. Ordinarily this is difficult to determine. An opportunity to assess it occurred when the drug was used in electro-convulsive therapy. Succinylcholine solution in thiopentone was injected intravenously, and varying time intervals were allowed to elapse before the convulsion was induced.

It was found that after five minutes the paralysing effect of the drug had completely disappeared and the convulsion occurred as if no succinylcholine had been administered.

The diffuse non-coordinated muscular contractions are due to the preliminary excitation of the muscle membrane by the drug. Depolarization of the membrane produces these contractions. The depolarization continues; thus the muscle becomes refractory to stimuli and relaxation ensues.

The drug has a similar action to that of decamethonium iodide. Because of its curare-like effect, d-tubocurarine chloride and ether should block the action of this drug on the muscle membrane. The resultant effect, of course, will depend upon the degree of curarization or the degree of saturation with ether existing at the time when the succinylcholine is administered (*vide infra*, clinical use).

There is no known antagonist. Because of the ultra-short action of the drug there appears to be no need for such an agent. By the time an injection of an antagonist was made the effect of the succinylcholine would have ceased *sua sponte*. Theoretically "Prostigmin" should prolong its action. When the drug is given intravenously to the conscious subject the onset of muscular contractions and paralysis is remembered as being most unpleasant. There appeared to be no central effect with this agent.

9, 1952

when
y non-

no pro-
loses a
with
onium
At the
manent

weight
be any
clinical
de. It
to five
however,
ing of
ascular

akness
yncope

aneous
was no

brilla-
fifteen
ns are
upper
The
The
y this
com-
in the

s used
l with
aneous
conds.
nal in

point
n had
e. An
s used
lon in
time
n was

effect
ulsion
ered.

s are
brane
duces
thus
tation

onium
arine
drug
ourse,
egree
n the
ise).

ultra-
d for
gonist
have
ould
ously
ctions
asant.
ut.

f
c
h
t
a
v
y
l
o

n
t
f
a

o
b
s

i
t
-

is
0
p
m
o

b
p

Technique of Administration.

Because of these very unpleasant subjective sensations described above, it is essential that some narcotic be used, either before or at the same time as the drug is administered.

Scurr suggests that for electro-convulsive therapy the drug be given before thiopentone.

The subjective phenomena are due not only to the paralysing effect, but also to the fasciculations which occur within fifteen seconds of administration. It is advised, therefore, that the thiopentone be given with the agent or immediately preceding it. If the thiopentone follows the agent, fasciculations occur before consciousness is lost.

Administration of succinylcholine chloride with thiopentone may be performed in one of three ways, as follows. (i) By direct mixing with excess of thiopentone. The succinylcholine must be added to the thiopentone within the proportions stated, when the solution will remain clear. This method is simple and effective and requires the minimum of apparatus. (ii) By the administration of each drug from a separate syringe, each syringe being attached to a common two-way tap. This leads into a capillary rubber tube vein seeker and needle. This is the technique we described in the article on the use of decamethonium iodide. By this means small amounts of succinylcholine are washed into the vein by thiopentone solution and no troublesome precipitate is formed. (iii) By the use of a separate syringe for each drug. The thiopentone is first injected, the syringe is disconnected, reflux of blood is allowed and the succinylcholine is injected.

Clinical Use.

It would appear that because of the ultra-short action of the drug it will not displace decamethonium iodide. Its indications will be limited to the following circumstances: (i) as an aid to intubation; (ii) for the production of profound relaxation for orthopaedic manipulations; (iii) for the prevention of severe muscle spasm in electro-convulsive therapy.

Intubation.

Profound relaxation of the jaw muscles and complete separation of the cords made intubation easy. The passage of the tube into the trachea evoked no response. It was found possible to follow this immediately with administration of the anaesthetic of choice. The dose in millilitres of succinylcholine chloride for intubation was 1% of the body weight in pounds; for example, a patient for thyroidectomy weighing 150 pounds was given a mixture consisting of 1.5 millilitres of succinylcholine solution and 5.0 millilitres of thiopentone solution.

The average ten-stone adult requires no more than five millilitres of 5% thiopentone solution for intubation when this agent is used. For instance, in dental surgery performed in the surgeon's rooms the small amount of narcotic assured early ambulation.

Where prolongation of anaesthesia is affected by the use of a weak inhalational agent, it is suggested that the cords be sprayed with a topical analgesic or that the tube be smeared with an analgesic ointment.

Manipulations.

For manipulations the dose is in general that used for intubation, and again the amount of thiopentone is kept to a minimum.

Electro-convulsive Therapy.

In electro-convulsive therapy the dose of succinylcholine is one-half that used for intubation—that is, in millilitres, 0.5% of the body weight in pounds. The smaller dose produces only partial paralysis of the muscles, so that it may be clearly observed whether the convulsion has occurred or not.

If a larger dose is given, no reaction of the muscles can be elicited, and it is not known therefore whether the patient has responded to the shock stimulus.

It is again emphasized that the succinylcholine must not precede the thiopentone, otherwise the patient remembers the unpleasant subjective phenomena. Patients consider these to be more distasteful than the shock therapy. The use of a minimal amount of thiopentone in this way did not adversely affect the course of the convulsion, nor did it retard the immediate recovery of the patients. Most became ambulatory within half an hour.

Closing of Peritoneum.

In accordance with the suggestion of Scurr, succinylcholine was given at the close of operation to observe its effect. The agent was administered some twenty minutes after the administration of a full dose of d-tubocurarine chloride. No apnoea occurred. In fact, some obvious increase in amplitude of respiration was noted. Succinylcholine was also given at the end of operation when anaesthesia had been maintained with ether.

In one case in which the plane of anaesthesia was deemed to be light, no fasciculations were observed, but apnoea occurred for two minutes. In another case in which the plane of anaesthesia was considered to be deep, again no fasciculations were observed; apnoea did not occur, but depressed respiratory amplitude was noted for some two minutes. These incidents are examples of the pharmacological actions referred to above.

Repeated and Prolonged Use.

Although for prolonged action a relaxant such as decamethonium iodide is more conveniently used, it is feasible to prolong the action of succinylcholine by repeated administration. It was found that for an average adult a dose of 0.1 millilitre repeated every three to five minutes was satisfactory and produced adequate continued relaxation without apnoea.

For prolonged use Von Dardel reports the use of an intravenous transfusion of the drug.

Side-effects.

Although there was a minor degree of histamine liberation as compared with d-tubocurarine, in no case in which succinylcholine was used did bronchospasm or laryngospasm occur.

Salivation.

Salivation has been reported with the use of tachycurine. When atropine was included in the premedication no salivation occurred. Atropine was not given to patients receiving electro-convulsive therapy. In these mucus production was less when succinylcholine was administered than when it was not exhibited.

Cardio-vascular System.

Reference has already been made to non-irritation of the veins.

A small rise in diastolic and systolic blood pressures was noted. This must be expected with the initial pronounced muscular activity associated with the use of this drug. Because of the constant apnoea, a feature of this agent, there is retention of carbon dioxide, and some rise of blood pressure must be expected. The rise in blood pressure was never more than twenty millimetres of mercury and the figure soon returned to normal.

Electrocardiographic recordings revealed no abnormalities in tracings even at the moment of intubation.

Summary.

A preliminary report on succinylcholine chloride is presented with details of the technique used.

This drug has an ultra-short action as a profound relaxing agent of the muscular system. The onset of relaxation is rapid and the agent produces ideal conditions for immediate intubation.

If precautions are taken the drug is miscible with thiopentone. The amount to be added to the thiopentone solution must never exceed half the volume of thiopentone solution. It is suggested that the mixture be used within ten minutes of preparation.

A minimal amount of thiopentone is required for use with it, considerably less than with other relaxants. The advantages of this are noted.

There is apparently no after effect and the drug is non-toxic to most tissues and organs.

With normal clinical dosage apnoea of two to three minutes' duration is a constant feature.

It is essential, then, that drugs of this type should be used only by those familiar with the technique of controlled respiration and where facilities exist for carrying it out adequately.

Acknowledgements.

We are indebted to the resident medical officers of the various hospitals for their most helpful cooperation. Thanks are again due to Allen and Hanburys, Limited, for making available a supply of this new agent.

Bibliography.

- Balthasar, A. P., and Sara, C. A. (1949), "Decamethonium Iodide C10 in Anaesthesia: A Preliminary Report on a Short Series of Cases", *THE MEDICAL JOURNAL OF AUSTRALIA*, Volume II, page 777.
- Marshall, S. V., and Daly, H. J. (1946), "Curare in Anaesthesia: A Preliminary Note", *THE MEDICAL JOURNAL OF AUSTRALIA*, Volume II, page 14.
- Myerhoffer (1951), *British Medical Journal*, Volume II, page 668.
- Ottolenghi, R. (1951), *British Medical Journal*, Volume II, page 668.
- Paton, W. D. M., and Zaimis, E. J. (1950), "Actions and Clinical Assessment of Drugs which Produce Neuromuscular Block", *The Lancet*, Volume II, page 568.
- Scurr, C. F. (1951), "A Relaxant of Very Brief Action", *British Medical Journal*, Volume II, page 831.
- Thesleff, S. (1951), *British Medical Journal*, Volume II, page 668.
- Von Dardel, O. (1951), *British Medical Journal*, Volume II, page 668.

AN ADDITIONAL NOTE ON A SIMPLE METHOD FOR ESTIMATION OF 17-KETOSTEROIDS IN URINE.¹

By VERA I. KRIEGER, D.Sc.

(From the Department of Pathology, the Women's Hospital, Melbourne.)

THIS short communication has a twofold purpose. Firstly, it is necessary to correct an error in my original publication, "A Simple Method for Estimation of 17-Ketosteroids in Urine" (1950). Secondly, continued work with this method has suggested the desirability of discussing in some detail certain points that have arisen.

Correction of Error.

The solvent for the 2% m-dinitro-benzene in the Zimmermann reaction must be ethanol and not methanol (Krieger, 1950) if the comparison is to be made with the cobalt standard described. If the m-dinitro-benzene is dissolved in methanol the colour developed is very weak and a more dilute cobalt standard will have to be used.

Points of Interest.

Close Colour Matching between Standard and Unknown.

It is necessary to stress the need to choose an aliquot of the unknown solution which gives a colour very close to that of the cobalt standard. Great discrepancies in results occur if an unsuitable aliquot is chosen. This is well illustrated in Table I.

Concentration of Potassium Hydroxide.

A critical condition, if accurate results are to be obtained by the Zimmermann colour reaction, is the concentration of potassium hydroxide.

¹ This work was made possible by a grant from the National Health and Medical Research Council of Australia.

In our earlier tests one sample of a 15% solution of potassium hydroxide in methanol was used in all the estimations performed over many months. In the present series two different solutions of potassium hydroxide (15%) in methanol produced the very different results shown graphically in Figure I. This graph also shows the agree-

TABLE I.

Millilitres of Alcoholic Extract from One Sample of Urine.	Colorimeter Reading. ¹	Results of Both Methods in Milligrammes of 17-Ketosteroid per Twenty-four Hours.	
		By Visual Colorimeter.	By Photoelectric Method.
0.5	4.6	20.9	27.6
0.4	5.5	21.8	26.3
0.3	6.7	25.1	24.0
0.2	9.7	24.7	25.0
0.1	13.8	35.8	—

¹ Cobalt standard set at 10.

ment in duplicate assays when the same reagents are used and both lots of test material are heated at the same time. Three times normal potassium hydroxide solution in methanol is recommended as a suitable concentration of alkali, and its normality should be checked frequently.

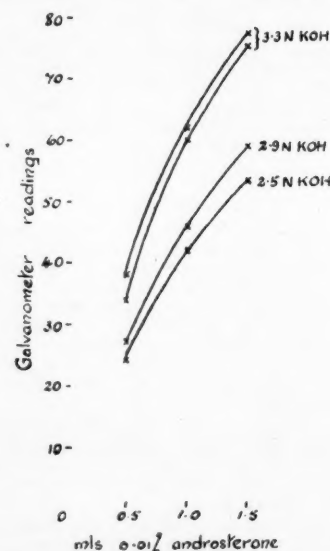


FIGURE I.

Curves obtained by the Zimmermann colour reaction for 17-ketosteroids, by the use of different concentrations of potassium hydroxide.

Temperature.

A further critical condition is the development of colour at an exactly controlled temperature.

The susceptibility of the colour development to slight variations in temperature, coupled with the difficulty in maintaining a temperature of exactly 25° C. for seventy-five minutes without a thermostatically controlled water bath, led me to explore the possibility of using a temperature of 37.5° C. for the reaction.

Photoelectric colorimeter readings for the intensity of colour developed by incubating 0.5 millilitre, 1.0 millilitre and 1.5 millilitres of 0.01% androsterone solution with the

colour developing reagents at 37.5° C. for fifteen, thirty, forty-five, sixty and seventy-five minutes are shown in Figure II. At this temperature the colour was much more intense after only thirty minutes than after seventy-five minutes at 25° C., and colour corresponding to 0.5 millilitre of 0.01% androsterone solution could not be matched with the standard cobalt solution. However, an intensity of colour closely matching that of the cobalt standard was obtained when 0.5 millilitre of 0.01% androsterone

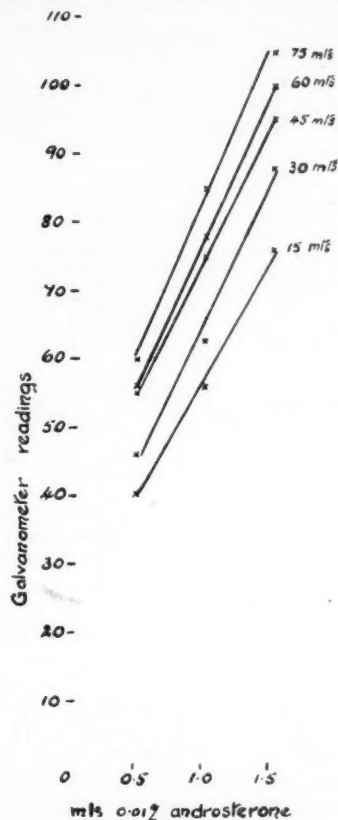


FIGURE II.

A comparison of curves obtained by the Zimmermann reaction for 17-ketosteroids by incubation at 37.5° C. for different periods of time.

solution and the reagents were incubated at 37.5° C. for fifteen minutes. I therefore recommend colour development by incubation at 37.5° C. for fifteen minutes as being satisfactory for both photoelectric estimation in which aliquots of 0.01% androsterone solution are used to prepare the comparison curve and visual colorimetric estimations in which the cobalt solution only is used as the standard of comparison.

Preparation of Standard Curve for Photoelectric Estimation of 17-Ketosteroids.

I have studied the colour development in assays of 17-ketosteroids by the Zimmermann reactions, using three times normal potassium hydroxide solution in methanol and incubating the mixture at 37.5° C. for fifteen minutes. By the use of a photoelectric colorimeter, significant differences in the intensity of colour developed by the Zimmermann method were obtained in several tests in which the same amount of 17-ketosteroid was assayed with the same reagents, temperature and period of incubation, but at different times. This was true for longer incubation

periods at 37.5° C. as well as for seventy-five minutes' incubation at 25° C. It therefore seems necessary, in order to obtain accurate results, to plot a curve of the intensity of colour developed with 0.5 millilitre, 1.0 millilitre and 1.5 millilitres of 0.01% androsterone solution with every batch of unknowns.

Relative Merits of Photoelectric and Visual Colorimeter with the Use of the Cobalt Standard for Estimation of 17-Ketosteroids.

Whilst the use of the cobalt standard in a visual colorimeter does not give such accurate results as those obtained by the photoelectric colorimeter with the use of androsterone as the standard, definite increases in 17-ketosteroids can be detected. In borderline cases slight increases may be missed. However, at times this method may be of great value, in that it does detect gross differences and it may be the only method available, since androsterone is still often difficult to obtain.

If cobalt standard is used we recommend that stocks of ethanol (pure anhydrous, 99.6 by volume) and three times normal potassium hydroxide solution in methanol, as well as solid very pure m-dinitro-benzene, should be kept so that the reagents need to be changed as little as possible. The conversion factor should be determined whenever a new reagent is introduced, since this varies slightly even when different solutions of the same sample of m-dinitro-benzene in ethanol and the same solution of potassium hydroxide in methanol are used.

Reference.

Krieger, V. I. (1950), "A Simple Method for Estimation of 17-Ketosteroids in Urine", *THE MEDICAL JOURNAL OF AUSTRALIA*, Volume II, pages 679 and 680.

Reviews.

THE CLINICAL USE OF RADIOACTIVE ISOTOPES.

THE University of California Radiation Laboratory under J. H. Lawrence has earned world-wide recognition for its researches into many phases of high-voltage radiations and artificial radioactivity. B. V. A. Low-Beer, associate professor of radiology at the medical school of that university, has published a volume entitled "The Clinical Use of Radioactive Isotopes".

In the first part of the book the author considers physical problems, and chapters are devoted to such considerations as atomic structure, atomic energy, types of nuclear radiations, and natural and artificial radioactivity. Under the heading of units and standards, a chapter is devoted to a consideration of problems of measuring radiation energy, and in particular the problems involved in energy absorption in tissues which become matters of particular concern when isotopes of one or another type are administered internally for therapeutic or tracer purposes. The physical section is presented for the radiotherapist in an understanding fashion. But there is much material in the form of tabulations and mathematical treatment which is more suited to the needs of the clinical physicist.

Part II is devoted to a consideration of clinical applications. Each isotope of clinical value is mentioned, and the methods of its production and chemical preparation for clinical use are given in detail. Then follow descriptions of the applications of each isotope to various relevant medical problems, the research investigations being described in brief detail. This section of the work forms a usefully brief reference handbook of the investigations made with those isotopes which have proved their value in elucidating problems of physiology or pathology. As such, it is a ready mine of information to the medical practitioner, be he physiologist or pathologist, physician, surgeon or radiotherapist, who has any problem which may be assisted by the use of radio-

"The Clinical Use of Radioactive Isotopes", by Bertram V. A. Low-Beer, M.D.; 1950. Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications, Limited. 9" x 6", pp. 436, with many illustrations. Price: 70s.

active isotopes. With the astoundingly wide applications of these isotopes there is no specialist whose interests have not been served by this new science. However, only a few are of real therapeutic importance, and chief among these are phosphorus, sodium, iodine and cobalt; numerous others have uses as tracers in one or another form of research activity.

The last chapter of the volume is devoted to radioisotope therapy and is covered in approximately 50 pages, half of which are devoted to the uses of radioactive phosphorus. The hopes which once were held that major new therapeutic agents had become available with the applications of the radioactive isotopes to medical practice have faded, at least temporarily. P^{32} has its great use in control of *polycythemia vera*, with lesser indications in the chronic leukaemias and the lymphoid reticulos. The author has developed techniques for external application of P^{32} for cutaneous uses, but the methods of preparation used do not allow the general acceptance of his methods with safety.

Radiolodine treatment of simple thyroid disorders is reviewed in a chapter which records the work of leading investigators. The author points out that comparison of results is most unsatisfactory, as there have existed grave discrepancies in dosage measurement of radioactive iodine samples and much work recorded before 1949 is therefore unsoundly based. The malignant diseases of the thyroid have not proved amenable to radiolodine therapy, as the anaplastic characteristics of the growth are associated with loss of the property of iodine pick-up. In but few of the alveolar types has such treatment been of real value.

Cobalt⁶⁰, with a γ -ray emission of reasonably high power, is seen as a possible radiation source, which may displace radium for clinical uses. Cobalt is easily activated in the pile, and is being used as a source of γ rays in the form of needles or tubes and in large units for teleradiotherapy. This brief chapter on the uses of cobalt⁶⁰ is packed with interesting information for the radiotherapist.

Low-Beer is an exceptional person, who has had training as physicist, physician and radiotherapist. This book reveals the breadth of his training and outlook. He shows a great enthusiasm for his physics and a ready discernment of the values of the isotopic tools for medical research, but as a physician he is most cautious in his appraisal of the therapeutic uses of the isotopes. The printing and format of the volume leave little to be desired.

RECENT ADVANCES IN BACTERIOLOGY.

The third edition of "Recent Advances in Bacteriology" is mainly the work of Dr. J. D. MacLennan.¹ As Professor J. H. Dible, author of the earlier editions and editor of this one, notes in his preface, the stormy interval (1939 to 1951) between its initiation and completion has inevitably caused some inequalities in the book. Had it been published in more placid times, such a feature would justify adverse criticism. But in this book, even if it lessens the informatory content implied in the title, it also subtly conveys a sense of both the achievements and the difficulties of scientific work during such a turbulent and changeable span of years.

The book opens dramatically with a clear description of the electron microscope, and illustrations of the new and amazing world it reveals. Six of the sixteen chapters deal with the anaerobic bacteria and their role in diseases of man and animals. It is not surprising that they are perhaps the highlight of the book, as they stem from the author's experience and distinction in this field during World War II.

In general, the method of approach has been to outline in historical perspective developments leading up to present knowledge of fundamental problems such as morphology, physiology and antigenic composition of those groups of organisms selected for discussion, and to assess whether such knowledge is relatively complete, or whether there are gaps meriting further investigation. To avoid an overload of detail, clear indication is given as to which original papers or reviews would give the most information to those especially interested in any particular aspect. The book therefore may be read, with profit and enjoyment, rather for its intrinsic interest than as a guide to new techniques or methods of investigation of value in clinical bacteriology.

¹"Recent Advances in Bacteriology", edited by J. H. Dible, M.B., F.R.C.P.; Third Edition, by J. D. MacLennan, M.B.E., M.D., with the assistance of Mary Barber, M.D.; 1951. London: J. and A. Churchill, Limited. 8½" x 5½", pp. 332, with 14 illustrations. Price: 25s.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Glaucomas", by H. Saul Sugar, M.D., F.A.C.S.; 1951. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9" x 6", pp. 469, with 123 illustrations. Price: £6 6s.

Various aspects of "the group of diseases known as the glaucomas" according to the author's experience and viewpoint.

"A Synopsis of Hygiene (Jameson and Parkinson)", by Llywelyn Roberts, M.D., M.R.C.P., D.P.H., assisted by Kathleen M. Shaw, M.B.E.; Tenth Edition; 1952. London: J. and A. Churchill, Limited. 9" x 6", pp. 900, with 11 illustrations. Price: 42s.

The first edition was published in 1920.

"A Manual of Parasitology for Medical Students and Beginners", by Mark M. Schapiro, M.D., M.S., with a foreword by Philip Manson-Bahr; 1951. New York: Grune and Stratton. 9" x 6", pp. 152, with eight illustrations. Price: \$5.50.

Intended as a guide to the medical student in the identification of parasites.

"The English Pioneers of Anaesthesia (Beddoes, Davy, and Hickman)", by F. F. Cartwright; 1952. Bristol: John Wright and Sons, Limited. 9" x 6", pp. 348, with 29 plates. Price: 21s.

Is a biography of three persons—Thomas Beddoes, Humphry Davy and Henry Hill Hickman.

"A Synopsis of Neurology", by W. F. Tissington Tatlow, M.D., M.R.C.P. (London), J. Amor Ardis, M.B., Ch.B., D.P.M. (Bristol and London), and J. A. R. Bickford, M.R.C.S., L.R.C.P., D.P.M. (Bristol); 1952. Bristol: John Wright and Sons, Limited. 7½" x 5", pp. 524, with 84 illustrations. Price: 30s.

Intended for senior undergraduates and for post-graduates studying for higher qualifications.

"Malignant Disease and its Treatment by Radium", by Stanford Cade, K.B.E., C.B., F.R.C.S., M.R.C.P., F.F.R. (Hon.), with a foreword by Ernest Rock Carling, F.R.C.P., F.R.C.S., F.F.R.; Volume IV, Second Edition; 1952. Bristol: John Wright and Sons, Limited. 9½" x 6½", pp. 558, with 785 illustrations, a few in colour. Price: 63s.

This volume (IV) deals with a miscellaneous group of tumours.

"Penicillin Decade 1941-1951: Sensitizations and Toxicities", by Lawrence Weld Smith, M.D., and Ann Dolan Walker, R.N.; 1951. Washington: Arundel Press, Incorporated. 8½" x 6", pp. 126.

Consists of twenty-two sections with "conclusions" and an extensive bibliography.

"Pathology of the Fetus and the Newborn", by Edith L. Potter, M.D., Ph.D.; 1952. Chicago: The Year Book Publishers, Incorporated. 10½" x 7½", pp. 592, with 601 illustrations. Price: \$19.00.

The author has attempted to present a brief but complete picture of the infant and to correlate its embryological development, intrauterine environment and post-natal physiological adaptations with specific conditions responsible for morbidity and mortality.

"The Diagnosis of Nervous Diseases", by James Purves-Stewart, K.C.M.G., C.B., M.D. (Edinburgh), F.R.C.P., and C. Worster-Drought, M.A., M.D. (Cantab.), F.R.C.P.; Tenth Edition; 1952. London: Edward Arnold and Company. 9" x 6", pp. 972, with 388 illustrations, a few in colour. Price: 50s.

James Purves-Stewart died in June, 1945; Dr. C. Worster-Drought had worked with him on the present edition since 1948. Purves-Stewart approved the almost completed work before his death.

The Medical Journal of Australia

SATURDAY, APRIL 19, 1952.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

KWASHIORKOR.

IN a recent discussion in these columns on nutrition, based on a report issued by the World Health Organization, reference was made to a tropical nutritional disorder known as kwashiorkor. The subject was stated to be so important as to call for a separate discussion. The Joint Committee of the Food and Agriculture Organization of the United Nations and of the World Health Organization, which was responsible for the report on nutrition, took such a serious view of the prevalence of the disorder that among its recommendations was one that the attention of governments in regions likely to be affected and of workers in medicine, public health, agriculture and other spheres should be drawn to the importance of the problem. A report by J. F. Brock and M. Autret dealing with the matter is in the press, and the Joint Committee wishes to have this report circulated. At its session in October, 1949, the Joint Committee referred to kwashiorkor as one of the most widespread nutritional disorders in tropical and sub-tropical areas. The condition is not well known among medical practitioners, even by name. This state of affairs should be remedied, chiefly because the significance of its occurrence should be recognized and also its relationship to other deficiency disorders of nutrition.¹

Kwashiorkor is described in the WHO report as being characterized by (a) retarded growth in the late breast-feeding, weaning and post-weaning phases; (b) alterations in skin and hair pigmentation; (c) oedema; (d) fatty infiltration, cellular necrosis, or fibrosis of the liver; (e) heavy mortality if better protein is not supplied in the diet; and (f) a variety of dermatoses, commonly but not invariably associated. There is stated to be a gradual transition of clinical features from kwashiorkor to

marasmus, and it is impossible at present to define clearly the borderline between these two conditions. The disease is not different from a condition known in Germany as *Mehrnährschaden*, and its resemblance to other diseases will be referred to later on. Generally speaking the condition is one of infancy. It is usually described as occurring in infants, but references are found to its occurrence in adults. Lucy Wills, who worked in a Zulu hospital in Durban and whose views are reported in *The British Journal of Nutrition*, states that adults may be affected. The age incidence is summarized in "The Medical Annual" as follows: 0 to 4 months, nil; 4 to 6 months, 1%; 6 to 12 months, 15%; 1 to 2 years, 45%; 2 to 3 years, 24%; 3 to 4 years, 8%; 4 to 5 years, 4%; 5 to 15 years, 3%. The disease is very rare so long as breast-feeding is maintained or cow's milk supplies are really adequate. The age period one to four years is a period of high protein requirement, and it is pointed out in the WHO report that under African conditions this is the period of life at which protein intake is likely to be at its lowest. As would be expected, kwashiorkor is linked with poverty. It is commoner among orphans and among destitute and neglected children, among those whose mothers have a broken family life, and among lower economic groups. It is also stated that maternal ignorance and apathy, as well as poor discipline during the period of weaning, play an important part in the aetiology of the condition. H. C. Trowell, who contributes the article to "The Medical Annual", describes mild cases and severe cases. He states that mild cases of kwashiorkor are so common that many doctors would regard it as almost normal 'if an African child in the second year of life should grow but little, should have brown, soft hair and a pale skin, and also should have a low serum albumin content. The clinical picture of the severe form is characteristic—"the mother unwraps a miserable imp, who immediately grizzles and cries and avoids the light. Eyes and nose are usually running, raw and red. The brown, soft, scanty hair is noticeable, as is the deepened pigmentation of the skin. Oedema is present: it tends to be generalized, and is sufficiently severe to block up the eyes and to suggest acute nephritis". Kwashiorkor does not occur in children who are not severely underweight. The liver may or may not be enlarged, but is not tender. There may be a trace of albumin in the urine, but casts or cells in the urine are almost unknown. Anæmia is not a common feature, but a mild anæmia occurs which is usually normocytic but may be macrocytic; it may be slightly hypochromic, but this is not a constant feature. On this basic picture other signs of malnutrition may be superimposed. Lucy Wills states that in populations living on diets consisting mainly of carbohydrates there are three constant ill-effects on the body. The first is on the hæmopoietic organ; the second is on the liver; and the third, which results apparently in part from the lack of protein itself and in part from the impaired liver function, is a shortage of suitable protein, so that the body has to call on its own supplies—this is shown by muscular wasting and by an abnormally low level of serum albumin. The liver is usually, but not always, severely affected in fatal cases: there is an accumulation of fat at the periphery of the lobule, but soon every cell may be involved. If this persists, then inflammatory cells accumulate and reticulín increases in

¹ Information on this disease will be found on page 22 of the World Health Organization report: in a report on the comparative merits of animal and vegetable foods in nutrition in *The British Journal of Nutrition*, Volume V, Number 2, 1951; in "The Medical Annual" for 1951, page 133; and in an article by J. N. P. Davies in *The Lancet*, Volume I, 1948, page 317.

the portal tracts; this gives way to fibrous tissue which creeps out along the edge of the lobule. During the first few years of life it is uncommon to find much increase of reticulin seeping around the sinusoids, and there is little disorganization of the hepatic lobule; that is, there is little cirrhosis. This question of cirrhosis is of considerable interest. It may be remembered that in September of last year, primary carcinoma of the liver was discussed in these columns in the light of a monograph on the subject by Charles Berman, of South Africa. Berman referred to the evidence that cirrhosis and other liver damage resulted from a generally deficient diet and not from the absence of any single food factor. His conclusion was that "possibly the distribution of liver cancer over a large part of the world depends upon a variable mixture of negative deficiencies and positive carcinogenic factors". The WHO report states that world maps of the distribution of kwashiorkor and of the high incidence of adult cirrhosis and primary carcinoma of the liver overlap to a very large extent, but not completely. It is pointed out that parasitic disease may play a part in the production of adult cirrhosis, but that the overlap with kwashiorkor and the evidence of the effects of protein deficiency in the production of experimental cirrhosis suggest the possibility that all three conditions may be produced in the main by protein-deficient diets. It is further stated that there is evidence that the relationship of adult cirrhosis and primary carcinoma of the liver to kwashiorkor is not one of direct sequence.

In regard to the causation of the condition, it is generally agreed that it is due to a poor diet which is defective in animal protein and especially lacking in milk. To accept this is not to deny that in addition there may be a gastrointestinal defect, so that the food is poorly digested or absorbed. Trowell has pointed out that if failure to utilize food is the essential condition, then one might expect the disease to follow the pattern of coeliac disease or fibrocystic disease of the pancreas. Severe oedema, however, has been but seldom produced in any type of gastrointestinal or pancreatic disease. Trowell suggests that kwashiorkor is a particular pattern of amino-acid deficiency, occurring at an age when protein requirements per unit of body weight are maximal. R. F. A. Dean, in the Nutrition Society's discussion, refers to the fact that vitamin B₁₂ is lacking in maize, which forms the chief diet of the children suffering from kwashiorkor, and that it is to be found in all the substances which can cure kwashiorkor. This, he thinks, may be a coincidence, but a trial of vitamin B₁₂ seems to be indicated, not only on empirical grounds, but because the vitamin is believed to be of importance in the metabolism concerned.

From this short statement on the manifestations of kwashiorkor, and on views held concerning its aetiology, a general impression of the condition should be obtained. It remains to observe that similar syndromes are to be found in many parts of the world. "The Medical Annual" tells us that in addition to kwashiorkor and *Mehrnährschaden* another 43 names have been given to similar conditions and that the medical literature runs to something like 150 different communications from about 100 different authors. Some people seem to think that a condition characterized chiefly by a deficiency of one prominent item in the diet would have the same clinical picture in another

country where the diet was chiefly deficient in the same substance. Clearly if this article is not present in a diet in sufficient quantity, there will be deficiencies of other essentials in the same diet. In no two places, we may safely state, will the deficiencies be exactly the same. It follows that the signs and symptoms manifested by the persons who live on these different diets will be different. The differences in the clinical pictures will be as divergent as the differences in the dietary. If we remember this, the descriptions of different clinical entities which seem to be closely allied will be more easily understood. Understanding is necessary before methods of prevention can be intelligently discussed. The whole problem of nutrition is possibly more urgent than any facing the world today. If the World Health Organization and the Food and Agriculture Organization of the United Nations can succeed in arousing practical interest in this subject among the nations of the earth, all the time, money and effort spent by them will be more than justified.

Current Comment.

INFECTIVE HEPATITIS AND CIRRHOSIS OF THE LIVER.

THE complex subject of hepatitis is well introduced by J. H. Dible in the third edition of Dible and Davie's "Pathology" with the statement that the most important special pathological changes which occur in the liver are necrosis and fibrosis. These are sometimes known as hepatitis; but it is explained that this term does not indicate a true inflammatory disease, but one in which there is necrosis of the liver cells. This necrosis may be so extensive as to cause death; if it is less severe, complete recovery may occur or else the change go on to fibrous replacement, which for some unknown reason generally seems to be progressive once it has passed a certain stage. Dible discusses hepatitis, necrosis and cirrhosis under one heading. He states that in toxic conditions such as eclampsia, and in poisoning by certain groups of drugs and by chemical substances used in industry, characteristic extensive necrosis may occur. Indistinguishable from the graver examples of drug or industrial necroses is the long-known condition of idiopathic acute yellow atrophy, in which no relation to simple toxic agents has been found. Evidence has also been accumulating during recent years to show that necrosis may be caused by nutritional factors. Evidence has come mostly from tropical countries, and many investigations have been undertaken to determine a specific dietary deficiency; but so far results have not been conclusive. In Dible's opinion the most that can be said is that the incidence of the disease seems to be greatest in those in whom poverty, and therefore presumably under-nutrition, are rampant. Whipple has shown that protein deficiency renders dogs highly susceptible to necrosis of the liver from chloroform, and György and Goldblatt have found that protein deficiency in the rat can cause massive hepatic necrosis. It has been suggested that the cirrhosis of the liver which has so high an incidence among Indians in the Punjab and the Rand may be dietetic in origin. However, the results of therapy based upon such views have been disappointing when applied to man. The course of events when damage of the liver occurs depends upon the severity and duration of the damage and the length of survival. When liver damage is the main lesion, death may occur early with a characteristic picture of acute massive necrosis; if the effect is more protracted, death will occur a little later with a picture of subacute necrosis. When the acute damage is even less, surviving liver cells may regenerate and replacement fibrosis occur in the areas in

which irreparable damage has been done, a picture of nodular hyperplasia resulting. Finally, there is the well-known condition of cirrhosis. During World War II infectious hepatitis came into great prominence. In Anderson's "Pathology" we read that no universally accepted term for the condition has yet come into general usage, and that the term "infectious hepatitis" is also referred to as "infective hepatitis", "virus hepatitis", "epidemic hepatitis", "catarrhal jaundice", "infectious hepatic jaundice", "non-spirochetal infectious jaundice" and "homologous serum jaundice".

Bearing in mind this short statement on liver damage and the conditions which may result from it, we may turn with profit to a recent contribution on infective hepatitis and cirrhosis of the liver from P. B. Fernando and R. S. Thanabalasunderam,¹ who write from the Department of Medicine in the University of Ceylon. They have studied 135 patients, who were admitted to the General Hospital, Colombo, during a period of five years and ten months between 1945 and 1950. These patients were suffering from jaundice, which was diagnosed as due to infective hepatitis, or from its complications. Twenty-five patients died, and 11 autopsies were carried out. In addition there were admitted to hospital suffering from portal cirrhosis seven patients who gave a history that the disease had been preceded by a severe attack of jaundice. In two of these seven cases it is possible that the disease was directly due to dietetic deficiency. The paper thus deals with 142 cases. The clinical course of these cases is described as falling into four distinct categories. The first is that of simple jaundice; it comprised 107 patients. The duration of the illness varied widely—twenty patients took two weeks to recover, two patients took nearly four months. One patient died in hospital. In the second category are ten fulminant cases. In some instances the patient died within a few days, and in eight cases the duration of the illness was altogether less than ten days. In two cases death took place on the fourteenth and twentieth days respectively. In the group described as acute massive necrosis, there were nine cases which ended fatally; in these the clinical course was different from that in the fulminant cases. There was a period in which the patient seemed to be recovering when the condition suddenly became worse. The average duration of the satisfactory interval was twenty days. Eight patients were included in the category subacute massive necrosis. In these cases, after a variable period of jaundice, which averaged about thirty-seven days, free fluid was found to be collecting in the abdomen. From then on general deterioration occurred; this was followed by alternating periods of improvement and deterioration. Two patients were discharged from hospital apparently cured after 150 and 180 days respectively; one patient had oliguria and subsequently coma after paracentesis, and was taken home. Five patients died in coma after an average period of seventy-seven days of illness. Five of the seven patients admitted to hospital with cirrhosis of the liver gave a history of onset of illness similar to that of infective hepatitis. They were in good health until anorexia, malaise and nausea set in followed by jaundice. Four of the five patients recovered and were in good health when they left hospital. One patient left hospital after thirty days of treatment with no improvement, and two patients died. In regard to aetiology, the most important aspect discussed is that of diet. Four types of diet are described; in diet A two good meals were taken each day, in diet B animal foods were taken only about twice a week, in diet C no animal protein was taken, and diet D was very poor, consisting of rice or some preparations of flour or some yams with one vegetable. Meat or fish was taken only about once or twice a month or not at all; moreover, the quantities taken at each meal were insufficient and sometimes there was only one meal a day. The important conclusion is that the serious complications, of a fulminant course and massive necrosis, increased in frequency as the diets became more and more deficient in animal protein. Fernando and Thanabalasunderam state that there are two views in regard to the relationship of

infective hepatitis to acute and subacute massive necrosis. One view is that idiopathic massive necrosis represents the end stage of fatal epidemic hepatitis; the other is that it is a complication supervening on infective hepatitis in subjects whose livers are already weakened and unable to bear the further strain caused by this infection. They think that their findings support the latter view. In regard to what determines the complication, they point out that in dietetic massive necrosis the factor is the composition of the blood reaching the liver. A deficiency of protective amino acids induces necrosis, while an adequate content prevents it. With less deficient diets which produce only partial massive necrosis, areas of the liver with a comparatively deficient blood supply are more liable to necrosis than areas in which the circulation is free. Swelling of the liver inside the rigid capsule may restrict the circulation of blood to certain areas. This may be sufficient by itself to determine a state of deficiency in those areas, irrespective of the presence of adequate factors in the blood; but when there is a deficiency of protective amino acids in the blood, these vascular factors may operate more easily. Fernando and Thanabalasunderam state that the higher mortality rate of infective hepatitis and serum jaundice in subjects who have had deficient diets compared with those who have been well fed, in spite of the operation of vascular factors, supports this view. It is important to note that in two of the patients reported, it appeared as if subacute massive necrosis, like the experimental dietetic massive necrosis, occurred as a result of dietetic restriction alone. The practical bearing of this observation on the prevention of liver damage is obvious.

NARCOTICS IN PRE-ANÆSTHETIC MEDICATION.

A NUMBER of widely accepted practices are challenged in a recent study on the use of narcotics in pre-anæsthetic medication published with the authority of the Council on Pharmacy and Chemistry of the American Medical Association.¹ The authors, E. N. Cohen and H. K. Beecher, trace back for over a century the practice of using morphine as an hypnotic agent prior to the induction of anaesthesia and refer to its wide acceptance. Nevertheless, they refuse to be awed by its age or popularity and produce evidence to show that a narcotic is not essential in this role and that the same function can be adequately performed by a barbiturate with fewer undesirable side-effects. They carried out a controlled study on 558 patients undergoing anaesthesia with ether, cyclopropane or thiopental sodium. Drugs used for premedication included morphine sulphate and atropine, pentobarbital sodium and atropine, and atropine alone. Pre-anæsthetic interviews with the patient, after administration of the drugs, an appraisal by the anaesthetist, and a post-anæsthetic interview indicate few differences in the effectiveness of these premedication drugs. Smoothness of induction of anaesthesia, muscular relaxation as measured by the time for insertion of an endotracheal tube, depth of anaesthesia as indicated by venous blood levels of cyclopropane and of ether, and observations of milligrammes of thiopental sodium required per minute all show no important and few significant differences with the three premedication agents. Blood oxygen saturation and carbon dioxide elimination were satisfactory in each case. Cohen and Beecher point out that, on principle, it is desirable to reduce the use of narcotics whenever possible. There should be little or no disagreement with this, or with the further principle stated that morphine and similar agents should not be used because of their power to produce euphoria, except in relation to the treatment of severe pain or for patients who are dying, as with terminal cancer. Cohen and Beecher produce good evidence to show that unless pain is present, narcotics are not needed in pre-anæsthetic medication. They consider that a small dose of pentobarbital sodium serves the same purpose and is safer.

¹ The Quarterly Journal of Medicine, October, 1951.

¹ The Journal of the American Medical Association, December 22, 1951.

Abstracts from Medical Literature.

RADIOLOGY.

Secondary Alterations of the Frontal Sinus in Paranasal Sinus Cancer.

LEWIS L. HAAS (*American Journal of Roentgenology*, November, 1951) calls attention to the frequency of secondary alterations of the frontal sinus in primary cancer of the other paranasal sinuses. He states that these changes can be grouped in three categories: (i) There may be an irregular opacity within the cavity of the sinus, consistent with a secondarily invading tumour. This is a rare radiological finding. It can be difficult at times to differentiate it from the homogeneous haziness of the sinus produced by obstructive congestion or by secondary infection. (ii) A relatively uncommon finding is the secondary infiltrative destruction of the wall of the frontal sinus. This alteration must be differentiated from the primary carcinoma of the frontal sinus. (iii) The commonest type of alteration is that in which the bony change is restricted to the margins of the sinus and to its immediate bony surrounding. The earliest radiological change is the partial demineralization or disappearance of the white line representing the normal compact layer of the wall of the frontal sinus; however, the outline remains sharp and smooth, making the alteration obvious only to the specially trained observer. Later smaller or larger sections of the contour, sometimes the entire margin, attain a blurred appearance. Occasionally the white line remains intact in some sections, but it will be obscured by condensation of the surrounding bony structure. In advanced stages the blurring of the outline is more marked and more irregular, and a more or less extensive condensation of varying intensity is visible in the surrounding bony structure. Frequently various grades of the demineralization and condensation can be found simultaneously in different sections of the sinus wall. These changes are localized usually to the superior and posterior wall. The anterior and inferior walls are rarely involved. Generally the alteration is unilateral on the tumour side. However, one can find it bilaterally also, and rarely on the contralateral side. Radiologically the alteration resembles a state of low-grade secondary osteitis, which can be found occasionally in cases of long-standing infectious sinusitis with intermittent or constant occlusion of the sinus ostia by polypus or other alterations of the sinus membrane.

Synovioma.

DEFOREST E. HALE (*American Journal of Roentgenology*, May, 1951) states that clinically there is little to identify synovioma from any other neoplastic soft-tissue mass. Röntgenologically certain findings are of diagnostic value; synovioma presents the shadow of a soft-tissue mass, whose outline is lobulated, in or near a joint. In some instances, calcium may be present within the mass and, when present, appears as a fine speckling, irregularly arranged. Differential points have been described which may help in dis-

tinguishing synovioma from other tumours, and in particular, from neurofibroma, fibrosarcoma, pigmented villonodular synovitis, lipoma and myositis ossificans. In the late stages of the disease, remote metastases are common, particularly in the lungs. An unusual finding is the presence of metastases in bone; this was observed in three instances. The prognosis in cases of synovioma is grave; only three five-year cures have been reported in the literature. Of the author's group of patients, four lived five years or more without evidence of disease; one of these died at the end of twelve years. The prognosis may well be influenced by the type of treatment instituted when the patient is first examined. Simple excision as the primary treatment was uniformly unsuccessful. Radiation therapy was of real value in only one of the nine to whom it was given; in the others its beneficial effect was questionable. Amputation or radical excision can be considered the most likely methods of treatment to produce a cure.

Primary Tumours of the Ureter.

R. BRIAN HOLMES (*Radiology*, April, 1951) states that primary neoplasm of the ureter is often not suspected in the urological patient until it is encountered at operation for removal of possible calculi or of a hydronephrotic kidney. Occasionally the diagnosis is made only after the specimen is in the hands of the pathologist. Inasmuch as most of these patients are studied by urography before any operative procedure is carried out, increased awareness on the part of the radiologist of the diagnostic possibilities and of the X-ray appearance of primary ureteral neoplasms should lead to more accurate diagnosis and more suitable handling of the patient by all concerned. Seventeen cases of primary carcinoma of the ureter have been reviewed. Haematuria is the outstanding common feature in the history. Radiologically, failure of excretion of contrast substance by the kidney on the involved side is the rule, or, if there is excretion, it is into a dilated renal pelvis and ureter, the dilatation in the latter extending down to the lesion. The lesion which is most commonly confused with or which masks a tumour of the ureter is ureteral calculus; occasionally a non-opaque stone may simulate tumour. Pain is usually associated with calculus, but is less frequent with tumour and is of a different type. The failure of the "stone" to move up or down the ureter on repeated examination over a period of time should suggest the presence of a tumour. It should not be forgotten, however, that calculus and tumour may occur together. If an opaque calculus is present, associated with non-opaque filling defects, the diagnosis of tumour should be kept in mind. Blood clot, by its irregular nature, may have an appearance identical with a ureteral tumour. In addition, a blood clot may also remain unchanged in position for a considerable time. Blood clot, however, rarely causes complete obstruction to the downward flow of fluid with subsequent failure of excretion of opaque medium, nor does it obstruct the upward passage of the catheter and/or dye. Blood clot is less likely than tumour to be associated with dilatation of the ureter. Ureteral stricture may give a picture similar to that caused by an

obstructing tumour, but in cases of stricture, congenital or otherwise, the degree of hydronephrosis and hydro-ureter is usually greater than is found with obstruction due to a tumour. This is probably to be explained by the fact that, because of the dramatic symptom of haematuria, the obstruction caused by a ureteral carcinoma is of relatively short duration. Tuberculous stricture of the ureter unassociated with evidence of other urinary tract involvement is rare, and its differentiation from tumour should cause little difficulty. In the former case, involvement of the contralateral ureter and the bladder is frequent, whereas in cases of tumour this practically never occurs.

PHYSICAL THERAPY.

Studies with Radioiodine.

E. R. MILLER, M. E. DAILEY, M. H. SOLEY *et alii* (*Radiology*, August, 1951) present data on the first 100 patients to whom I^{131} was given for the treatment of hyperthyroidism. They state that in the early work repeated small doses were given of approximately 250 microcuries at weekly intervals. As information and confidence grew, larger doses were given. At first it was hoped that the dose needed might be related to the severity of the hyperthyroidism and not to the size of the gland, but this has not proved to be the case. Since 1947 an attempt has been made to calculate the dose in radiation units, an effort being made to give an initial dose of 6000r equivalents. As the first step in treatment, a test dose of I^{131} , usually 100 microcuries, is administered orally to the fasting patient and the uptake measured at one, three and six hours after administration and afterwards for four days. The uptake curve is then drawn. From the estimated thyroid weight and the uptake curve, the amount of I^{131} necessary to give the required 6000r equivalents can be calculated. This is then given orally. In most cases more than one dose of I^{131} was given, as the first was calculated to "improve" but not cure the patient. The authors consider that of 100 patients, 89 obtained remissions, mostly in less than two months. Follow up over five years has shown a striking absence of recurrences.

Reticulo-Endotheliosis of Children:

Treatment with X Rays.

J. R. HODGSON, R. L. J. KENNEDY AND J. D. CAMP (*Radiology*, November, 1951) state that reticulo-endotheliosis is characterized by the presence of collections of hyperplastic reticulo-endothelial cells in bone and soft tissue. Three types are recognized: Letterer-Siwe disease, Hand-Schüller-Christian disease and eosinophilic granuloma of bone. The authors consider that the usefulness of irradiation in this disease is not fully recognized, and they report the experience of the Mayo Clinic in a series of 12 patients. The first patient in 1927 was treated by means of radium moulds. Since then all patients have been treated with X rays, a fairly uniform technique being used. The patients were examined at intervals of one to three months, and at each visit treatment was given to every lesion which appeared active. In the majority

1952

s of
the
dro-
bund
This
fact
otom
used
ively
cture
ence
it is
from
ulty.
the
er is
mour

. H.
951)
ents
eat-
state
mall
250
As
rger
oped
ated
dism
but
case.
le to
nits,
ltial
the
e of
nis-
and
and
and
take
the
the
ces-
008r
s is
ore
the
but
con-
ined
two
has
cur-

n:

AND
951)
is
col-
ulo-
sue.
rer-
rtian
of
the
case
port
n a
lent
tum
ave
irly
The
s of
sion
rity

d
b
t
o
I
d
t
c
t
g
t
t
t
d
t
d
d

(
ol
15
su
X
th
pr
th
us
ca
ise
fa
pr
de
bo
ex
oft
oft
for
pro
sh
Th
tre
ini
for
con
of
esp
syn
one
fur
con
res
lea
in
lesi
oth

Tr

V
Am
and
revi
whil
iodi
stat
day
 β a
radi
90%
thyr
adv
hyp
fuse
and

of cases a single dose of 150r to 200r was given over the affected area, but in the more deeply situated lesions (for example, those in the pelvis) several portals might be used, the aim being to give approximately 200r to the lesion. Nine of the 12 patients responded well, and the disease is considered to be arrested. In the remaining three cases the disease progressed rapidly and death ensued. In most cases, response to treatment occurred rapidly, lesions in lymph nodes and soft tissue regressing within ten days, and radiological evidence of healing in bone lesions was seen about thirty days after irradiation. It was found that at least three courses (600r) were necessary to control any specific lesion. All dosage given was kept as low as possible, and the authors do not know if higher dosage would have given better results. In one case which proved fatal, doses of about 1000r had been given before the child came to the Mayo Clinic, and bony lesions had not responded to this dosage.

Supraspinatus Tendinitis.

O. T. STERN AND A. L. McCULLOUGH (*The American Journal of Roentgenology and Radium Therapy*, February, 1951) review 300 consecutive cases of supraspinatus tendinitis treated by X-ray therapy. It is considered that this lesion begins as a degenerative process in the tendon fibres fused with the capsule of the shoulder joint, usually the supraspinatus. The initial cause is probably a local state of ischaemia with possibly contributory factors of occupational strain and aging processes. Following this phase of degeneration a non-suppurative foreign body reaction occurs, which generally extends into the tendon sheath and often into surrounding tissues. This is often, but not always, followed by the formation of calcareous deposits. The presenting symptoms are pain in the shoulder and limitation of movement. The pain may be extremely severe. Three hundred affected persons were treated by X-ray therapy. Usually an initial course was given of 150r daily for four consecutive days, but if the condition was of long standing, a dose of 200r daily was given. In many cases, especially in younger patients, the symptoms subsided rapidly, but if after one month symptoms persisted, a further course was given. The authors consider that 83.6% of the 300 patients responded satisfactorily. Response was least satisfactory in the older patient, in those with the more chronic type of lesion and in those who had received other treatment prior to irradiation.

Treatment of Hyperthyroidism with Radioactive Iodine.

W. G. SCOTT AND W. B. SEAMAN (*The American Journal of Roentgenology and Radium Therapy*, August, 1951) review 269 cases of thyrotoxicosis in which treatment was with radioactive iodine (I^{131}) since May, 1947. They state that I^{131} has a half-life of eight days, and during disintegration both β and γ rays are emitted. The β radiation accounts for about 85% to 90% of all the energy absorbed by the thyroid. Radioactive iodine therapy was advised regularly for patients with hyperthyroidism associated with diffuse goitre over the age of thirty years and for patients with post-operative

recurrence of hyperthyroidism at any age. Certain patients with hyperthyroidism associated with multinodular goitre were also treated. Patients under thirty years of age were not treated unless there was a recurrence following surgery, they had failed to respond or were sensitive to antithyroid drugs, or other serious complicating conditions were present. This was to avoid the theoretical possibility of a radiation-induced neoplasm arising in later life. Dosage in patients with diffuse goitre was based on the estimation of thyroid weight by palpation and was calculated to produce a satisfactory remission with a single dose. Most patients were given 0.2 millicurie per gramme of estimated thyroid tissue, but recently this has been reduced to 0.15 millicurie per gramme. Patients with nodular goitre or post-operative recurrent symptoms were given slightly higher doses, as experience indicates that these patients are more resistant to I^{131} . Radioactive iodine therapy was postponed for one month if the patient had had iodine therapy, oral cholecystography, pyelography or any other iodine medication. Of the group treated 195 are available for a six months' observation period; 117 had a diffuse toxic goitre, and of these 64 had a satisfactory remission following the first dose. Of the 35 patients with nodular goitre, the condition was controlled in 18 by the first dose. Hypothyroidism was the most common complication, and occurred in about 20% of all patients treated. Five patients had a temporary increase in the signs and symptoms of hyperthyroidism during the first week following iodine administration, but in only one case was this of clinical importance. Thyroid size was reduced to normal in most of the patients with diffuse enlargement, but only slight to moderate decrease occurred in toxic nodular goitres. In the last group single doses of less than 0.24 millicurie per gramme of estimated thyroid tissue produced more failures than successes, while larger amounts resulted in a great increase in the incidence of hypothyroidism.

Nitrogen Mustard as an Adjunct to Irradiation in the Management of Bronchogenic Cancer.

B. ROSWIT AND G. KAPLAN (*Radiology*, September, 1951) state that pulmonary resection offers the patient with bronchogenic carcinoma the best chance of cure, but 90% still come too late for surgery. When irradiation is possible, effective relief is often obtained with sometimes prolongation of life for months or even years. However, not every patient unsuitable for surgery is suitable for irradiation, and nitrogen mustard may be of assistance in these cases. Since January, 1947, 150 patients with inoperable bronchogenic carcinoma have been studied by the authors. Of this number 40 received nitrogen mustard as an adjunct to X-ray therapy when irradiation was inadvisable or no longer effective because of radioresistance, severe irradiation sickness, acute mediastinal compression or exhaustion of skin ports. Nitrogen mustard was given intravenously in doses of 0.1 milligramme per kilogram of body weight once daily for four consecutive days. This was repeated if indicated after four weeks, but not

more than two courses were given. A favourable result was obtained in 30 of the 40 cases. Results were based on subjective and objective response. In 12 cases improvement was such that X-ray therapy could be commenced. Patients with anaplastic growths showed the most favourable response. The remissions obtained lasted from one to seventeen weeks with an average of three and a half weeks. In the opinion of the authors nitrogen mustard should never be used as a substitute for radiotherapy in the presence of localized inoperable bronchial carcinoma. In such cases X-ray therapy gives longer remissions, prolongation of life for months or even years, and a rare cure.

Radium Beam Therapy.

C. A. P. WOOD (*The Journal of the Faculty of Radiologists*, October, 1951) outlines the history of radium beam therapy, which is otherwise known as telerradium treatment, radium bomb treatment and telecurie therapy. An account is given of the details of construction of the 10-gramme radium beam apparatus which was designed for the Radium Beam Therapy Research in London in 1935 and duplicates of which have been installed at several centres in Great Britain. The author states that a study of isodose curves makes it clear that patients selected for treatment by a 10-gramme radium beam must be those in whom the growth is situated at a depth of not more than five centimetres. For this reason such units find their greatest usefulness in the treatment of cancer of the mouth and throat. The object of the treatment has been to deliver an adequate and uniform dose of radiation throughout the whole of the cancer-bearing area, that is, to the lymphatic glands in the neck as well as to the primary growth. According to the results given for this series of cases no patient has had a block dissection of the glands in the neck. The details of the planning of the radiation fields are given at length. An analysis is made of the results of treatment by this method in 764 cases of cancer of the mouth and throat. Examples are cure rates of 25% for cancer of the floor of the mouth, 29% for cancer of the tonsil and 3.5% for intrinsic laryngeal carcinoma. The author states that an investigation which was begun some years ago to compare the effects of 200 kilovolt X rays and the γ rays of radium, has shown that the wavelength of radiation *per se* within the limits of the experiment has no significant effect on the clinical results. In recent years there have been rapid advances in the design and construction of high voltage X-ray apparatus; there is also the development of a radium beam unit using radioactive cobalt (Co^{60}), and the use of amounts of the order of 1000 to 2000 curies of Co^{60} has been considered. The two-million volt Van de Graaff X-ray machine has been in use in some centres, and linear accelerators working at four to ten million volts are soon to become available. With a beam unit of 1500 curies, the intensity at one metre is 20r to 30r per minute, as compared with 60r per minute for the Van de Graaff machine and 200r per minute for the four million volt linear accelerator. The latter also has the advantage over the others of increased depth dose.

Special Articles for the Clinician.

(CONTRIBUTED BY REQUEST.)

XVI.

CONJUNCTIVITIS.

CONJUNCTIVITIS is characterized by hyperæmia and discharge from the conjunctiva. Its causes are legion, ranging from mild non-organismal irritating agents to pathogenic bacteria and the virus of trachoma, whilst its signs vary from a benign though inconvenient irritation to the destructive lesions of the gonococcus and trachoma.

Organisms and Pathology.

The common organisms of infective conjunctivitis are the Morax-Axenfeld diplococcus (*Hæmophilus lacunatus*), the Koch-Weeks bacillus (*Hæmophilus conjunctivitis*) and the pneumococcus. Less commonly are found the gonococcus, the streptococcus and the staphylococcus. The red appearance of the conjunctiva is due to the presence of small clumps of dilated capillaries, and the discharge, which may be copious, consists of exudate from the conjunctiva, dead cells and pus.

The gonococcus, once a common cause of purulent conjunctivitis in the newborn (*ophthalmia neonatorum*), is so rare today that it is hardly necessary to mention the condition, except that its early treatment is most important. Prevention of conjunctival infection with this organism has been one of the great advances in the prevention of blindness. Should infection occur, the advent of penicillin (administered locally and parenterally) has given the oculist a specific antibiotic which has made his task easy, provided he receives such patients in the early stages of infection.

Acute Conjunctivitis ("Pink Eye").

Acute conjunctivitis, often called "pink eye", may be epidemic in schools, or may spread rapidly amongst members of a family. The pink appearance is often enhanced by tiny flame-shaped hemorrhages in the conjunctiva. It is often associated with upper respiratory tract infection. It usually occurs first in one eye and may spread to the other a few days later. The usual duration is from five to ten days in each eye.

Symptoms and Signs.

The patient complains first of a hot, gritty sensation under the lids, which feel sticky and heavy. Then appears a discharge, which is first mucoid and later becomes flecked with mucus, the quantity of which may bring about a constant collection of pus along the lid margins. The eyelids are commonly stuck together by inspissated pus in the mornings.

Discharge is a constant feature of conjunctivitis, though its degree is most variable.

Vision is undisturbed except when mucus lies temporarily on the surface of the cornea. There is some lachrymation, but very little photophobia unless there is an associated corneal lesion.

The lids are congested, and hyperæmia of the bulbar conjunctiva increases toward the fornix. The conjunctiva may become swollen and edematous (chemosis). The cornea remains bright and the pupil is normally brisk.

Treatment.

Frequent bathing of the eyelids with normal saline to promote the escape of the discharge is most important. The frequency with which this is done depends upon the amount of discharge.

The common mucopurulent conjunctivitis responds quickly to treatment with penicillin drops, 1000 units per millilitre, instilled every hour, or pH-adjusted "Sulphacetamide" drops, 10% to 30% strength, buffered with chlorbutol and used three-hourly.

Severe infections should be treated by the application of an anesthetic agent (1% "Dedcain" solution), and a few moments later painting of the lids with 1% silver nitrate solution on a dressed probe. At this stage the other eye may not be involved, and a drop of 1 in 2000 freshly prepared methyl violet solution should be instilled in that eye to try to prevent infection. In moderately severe infections methyl violet drops (1 in 2000) are most helpful; but the use of this solution must not be continued beyond the stage

of overcoming the infection, as it can set up conjunctival irritation. Application three times a day for the first day and twice on the second day should be sufficient. Methyl violet drops must be freshly prepared and used in a strength not greater than 1 in 2000. They have high bactericidal powers.

The use of an ointment at night is of the utmost importance. This is to prevent sticking together of the lids as much as possible and to promote the full escape of discharge. If the lids are allowed to become sealed together overnight, the organisms are enclosed in a most satisfactory culture medium, with the result that the course of the disease is much longer and the severity of the infection much greater. Even if "Vaseline" is all that is available, it should be used. For the same reason an eye affected with acute conjunctivitis should never be bandaged.

"Argyrol" is one of the most commonly used preparations for conjunctivitis and at the same time is one of the least satisfactory. It is low in bactericidal properties, and, being a colloidal preparation, it helps to stick the lashes and lids together, and when the eyes are bathed it makes cleaning of the lid edges and lashes very much more difficult.

Zinc sulphate drops should never be used in acute conjunctivitis. They cause much stinging even in a normal eye, but in an eye with acute infection of the conjunctiva they can be very uncomfortable and produce no benefit. Their great use is in chronic infections of the conjunctiva, which will be dealt with later.

There are many proprietary lines of ophthalmic ointments put up in one-eighth ounce tubes, but today drug allergies are so prevalent that one has to be careful when prescribing mercurial and even penicillin ointments. It is also as well to make sure that the base of the ointment does not contain vegetable oils. "Sulphacetamide" ointment with a mineral base is one of the safest that can be used.

Complications.

Allergic Dermatitis.—Once allergic dermatitis of the lids commences, it may take some time to subside, and patients must be careful in regard to the use of preparations such as face powder *et cetera*, of which they were previously tolerant. If an oily calamine lotion is prescribed for allergic dermatitis, it is as well to specify a mineral oil base, as the use of sunflower, peanut and other vegetable oils can cause a severe exacerbation of the allergic reaction. Cortisone drops (five milligrammes per millilitre, one drop every three or four hours) are a great help and comfort.

Corneal Ulceration.—Corneal ulceration is not a common complication, but one should always be suspicious of its presence if photophobia and lachrymation are present. If there is much chemosis, it is not uncommon to find small punctate ulcers close to the periphery of the cornea. Such patients should be sent to an oculist.

Chronic Conjunctivitis.

Chronic conjunctivitis is often a relapsing condition associated with some marginal blepharitis, and is usually present in people who have the type of skin that is subject to hyperkeratosis. It is a thin skin, deficient in pigment, and rather dry, and wrinkles like tissue paper. Many of these people are prone to the development of rodent ulcers in later life.

The symptoms are slight discharge, often with sticking of the lids on waking, redness of the eyes and a gritty feeling. Photophobia is not common unless there is a secondary corneal lesion. The lid margins are red, and tiny scales resembling dandruff collect between the lashes, which frequently fall out. The condition is usually aggravated by exposure to wind, dust and glare. The symptoms vary greatly, according to the severity of the condition and whether it is associated with much blepharitis.

Treatment.

The most common organism associated with chronic conjunctivitis is the Morax-Axenfeld diplococcus, and zinc sulphate is specific for this organism. Zinc sulphate is tolerated far more by a person with chronic conjunctivitis than by one who has a normal conjunctiva. For this reason any patients with severe chronic conjunctivitis can use drops containing up to 1.5 grains of zinc sulphate to the half-ounce. In mild cases the usual strength of 0.5 grain to the half-ounce is sufficient. A very good prescription is zinc sulphate 0.25 part, boric acid three parts, adrenaline 12.5 parts, chlorbutol 0.25 part, and water to 100 parts. No buffering is needed, as this solution is slightly hypertonic. In addition to the drops it is necessary to give these people an ointment to massage into the lids at night before retiring. It is important to stress the necessity for massage, because

this stimulates Meibomian secretion and helps to remove any scale that may be present around the lashes.

As in acute conjunctivitis, it is necessary to "feel your way" in regard to the choice of an ointment. Penicillin ointment is helpful in a number of these cases, but in a large percentage the condition is made worse, and allergic dermatitis may even develop. The same applies to yellow oxide of mercury ointment, and to a lesser extent to "Butyn" and "Metaphen". The safest of all in this respect is a "Sulphacetamide" ointment.

In severe cases associated with ulcerative blepharitis it may be necessary to foment the eyelids and then remove the crusts with forceps and paint the underlying ulcerated areas with brilliant green (1%) in alcohol (50%). The palpebral conjunctiva can then be painted with silver nitrate (1%), and after this initial treatment the patient should be able to control the condition with the above-mentioned treatment.

Differential Diagnosis.

It is surprising how often a case of "red eye" is labelled "conjunctivitis". It should be remembered that red eyes can be caused by quite a number of conditions which are not conjunctival in origin, such as superficial punctate keratitis, kerato-conjunctivitis, episcleritis, corneal ulcer, iritis, a foreign body under a lid, an ingrowing eyelash, a concretion from a Meibomian gland that may be eroding through the palpebral conjunctiva, or some chronic or recurrent corneal lesion; but as a general rule most of these conditions will cause photophobia and lachrymation without much, if any, muco-purulent discharge. Such a cause should be suspected when a "red eye" persists, especially after treatment, but no treatment should be given till a thorough examination has excluded the above possibilities.

A unilateral discharge with watering of the eye and very little, if any, redness of the conjunctiva, which persists in spite of treatment, is often associated with stenosis of the naso-lachrymal passages, especially in infants. Pressure on the lachrymal sac will cause mucus to come back through the punctum. These cases should be referred to an oculist.

To make an accurate diagnosis of conjunctivitis one should examine the eye under focal illumination with the aid of a monocular or binocular loupe. This is most easily carried out by examining the patient on a table with the examiner standing at the head. An uncomfortable eye or a nervous patient is more easily examined after the instillation of "Decalin" solution (1%) into the eye. If any other cause should be found, the redness of that eye will disappear when the cause is eliminated. On the other hand, if the condition is bilateral, and if both palpebral and bulbar conjunctiva and the lid edges are red and there is evidence of secretion, then the diagnosis of chronic conjunctivitis can be made.

Red eyes are not uncommon after the patient has attended the cinema, and they often occur with hay fever, and after exposure to a smoky atmosphere, and to wind, dust, glare *et cetera*. This is due to a sensitive conjunctiva and is not true conjunctivitis, although most lay people call the condition by this name. These patients are not very tolerant of zinc sulphate drops, which tend to sting and make the eyes redder. "Antistine-Privine" drops are very helpful for itching and redness associated with hay fever. A useful prescription for red eyes due to the other causes is as follows: "Hazeline" 10 minims, adrenaline 10 minims, "Chloretone" one grain, glycerin 0.5 drachm, rose water 0.5 drachm, ophthalmic vehicle (Stearns) to 0.5 ounce.

A. L. TOSTEVIN,
Adelaide.

British Medical Association News.

SPECIAL GROUP ON AVIATION MEDICINE.

A MEETING of the Special Group on Aviation Medicine (British Medical Association) was held on October 30, 1951, at 49 Mathoura Road, Toorak, Melbourne, AIR COMMODORE E. A. DALBY in the chair. The election of new members and the general business of the group were concluded before the scientific part of the meeting took place.

Barotrauma.

DR. NOEL E. H. BOX read a paper entitled "Barotrauma" (see page 538).

DR. E. H. ANDERSON, in opening the discussion, referred to the incidence of otitic barotrauma, upper respiratory tract

infection and other causes of sick leave amongst cabin attendants (air hostesses). Dr. Anderson said that in his experience in most cases the condition settled down with simple remedial measures such as the use of vasoconstrictors *et cetera*. He had experienced very few infections and rarely used antibiotics. He considered that allergy played an important part in producing some of the conditions.

DR. F. S. PARLE asked a number of questions, as follows. (i) Did children and young babies experience much barotrauma? (ii) When blebs appeared on the surface of the tympanic membrane, had they a direct connexion with the intratympanic cavity? (iii) Was oxygen lack a factor in causing barotrauma? One school of thought supported that view. Dr. Parle said that from his experience as a passenger, ear discomfort was prevalent and a cause of dissatisfaction to some persons. It was difficult to obtain any accurate figures regarding the incidence amongst air passengers. If Dr. Box could give any information on that point, it would be of great benefit. Dr. Parle also wondered what experience with pressurized aircraft showed. Dr. Parle said that that type of aircraft did materially lessen the incidence of barotrauma as far as one could judge. He quoted an instance of passengers when asleep descending onto Canton Island in a pressurized aircraft, and mentioned the low incidence of ear discomfort amongst them.

DR. T. MILLAR said that he considered the incidence of barotrauma to be much greater in civil than in military flying. The key to it was, of course, to prevent passengers with head colds from flying. He had noticed that very few females were able to autoinflate their ears satisfactorily. Dr. Millar said that, in addition to the normal remedial measures, in cases in which an effusion had occurred, he had used tympanic puncture. That was followed by the escape of a small quantity of straw-coloured fluid. The drum healed in a few days. That fluid had been present in the Eustachian tube. Many subjects did not report for treatment until there was fluid in the intratympanic cavity and tube, because deafness was then evident. Dr. Millar said that he always used antibiotics in those cases so as to prevent infection. He strongly recommended that treatment.

DR. H. MITCHELL said that he used Eustachian tube catheterization with great relief in many cases. He would like to see all aircraft pressurized to ground level.

DR. J. CRAIG asked Dr. Box which muscles were involved in opening the Eustachian tube. He said that he had found it an advantage to rotate the head away from the affected side, flexing it laterally in the same direction, and auto-inflating the ears. Crews of aircraft could be readily taught to inflate their tubes correctly. He asked what effects explosive decompression would have on the ears. Dr. Craig said that the allergy factor, in his opinion, played a part in the production of barotrauma. He thought that flying at high altitudes probably lessened that factor.

AIR COMMODORE E. A. DALEY, from the chair, referred to Dr. Millar's remarks regarding the incidence of barotrauma in civil and military flying. He thought that the training received in military flying helped a great deal. He mentioned an observation made during the last war that there was a higher incidence amongst bomber groups than amongst fighters in the Eighth Air Force. It was thought to be due to spasm of the tube. AIR COMMODORE DALEY asked Dr. Box if he had any similar experiences.

DR. BOX, in reply to the questions asked during the discussion, first said that he strongly recommended the use of antibiotics, particularly when exudate was present. As a rule he incised only bulging drums, but he had been interested to hear Dr. Millar's experience in that regard. Dr. Box considered most valuable the statistics collected by Dr. Anderson dealing with the incidence of barotrauma amongst cabin attendants. Dr. Box said that he had seen a number of cases of chronic barotrauma. A permanent perforation made the affected ear very prone to middle ear infection when a head cold was present. He had not seen barotrauma in a baby. At early ages the Eustachian tube was short and possessed a wide bore, so that the passage of air along it was facilitated. It had been interesting to hear of a pressurized aircraft descending onto Canton Island with passengers asleep and a low incidence of barotrauma. Dr. Box said that he would like to hear more about it, as it was an important observation on barotrauma to find a low incidence in such circumstances.

DR. BOX went on to say that in his paper he had not mentioned blebs on the tympanic membrane, although they were commonly seen in the early stages of barotrauma. Dr. Box agreed with Dr. Millar's remarks concerning the higher incidence of barotrauma in civil than in military flying.

Undoubtedly training played an important part in preventing it. With regard to Eustachian tube catheterization, which had been mentioned by Dr. Mitchell, Dr. Box said that he had not used it to any extent. He thought that unless it was carried out visually, with a nasal endoscope, it was difficult to be sure that the point of the catheter was in the Eustachian opening. In reply to Dr. Craig's questions, Dr. Box said that the pharyngeal muscles, as a group, assisted in opening the Eustachian tube. He considered that in explosive decompression there would be some barotrauma, particularly aero-otitis. He agreed with Dr. Craig and other speakers, who had mentioned the importance of allergy in some cases of barotrauma. He thought that it applied particularly to low-grade chronic cases. In reply to Air Commodore Daley, Dr. Box said that he thought it would take a great deal of analysis to prove or disprove a point such as the relative incidences of barotrauma in fighter and bomber groups.

of epilepsy and not of Apoplexy like the deceased Serjeant Aitchison.

(Signed)

J. BOWMAN,
Principal Surgeon of the Territory.
WM. BLAND,
Surgeon, Sydney.
T. R. CLAUSE, R.N.,
H.M.S. Success.

His Excellency in directing this Publication has been influenced not less by Motives of Justice to the Public, than to the Character of Surgeon Ivory of the Buffs. The ignorance of Connolly, which is rendered evident by the Proceedings and established by the Opinion of the Board, will prevent his again imposing himself on those, who have not had an opportunity of being informed of his incompetency as a Medical Practitioner: and to this end the Governor has considered it necessary to direct, that Connolly's Ticket of Leave be immediately withdrawn.

By His Excellency's Command,

ALEXANDER MCLEAY.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

GOVERNMENT ORDER.¹

[*The Monitor*, January 20, 1827.]

No. (3), Chief Secretary's Office,
January 12, 1827.

A Medical Board consisting of the Principal Surgeon of the Territory: the surgeon of HMS Success and William Bland Esquire, Surgeon, resident in Sydney having been assembled to investigate and report on the case of the late Serjeant Aitchison of the Buffs who died on the Morning of the 4th Instant, His Excellency the Governor is pleased to direct the Publication of the Opinion of the Board which is as follows:

Opinion.

The Court having duly considered all the Circumstances connected with the above Case and the Evidence adduced, are of opinion that Surgeon Ivory of the Buffs stands clearly exculpated from

1st. All possible Charge of Neglect of his Public duty and 2dly. That he is, in equal degree, from all imputation of want of Humanity.

The Grounds on which we have formed the above Opinions are

1st. That Surgeon IVORY in ordering the deceased Serjeant into Hospital, acted in conformity with the Usages and customs of the Service.

2dly. That we are fully convinced from a careful Consideration of the Dissection Report, also of a Preparation of a certain Portion of the ruptured Blood Vessel and other Parts connected with it, produced to us by Surgeon IVORY that no Medical Assistance, however prompt, could in this Case, have been of any avail.

3dly. From a very deliberate and careful consideration of the Opinion given in Evidence by Connolly: and from which we come to the conclusion that the said Opinions, in many Respects do not rest on sufficient, and in other Respects, on admissible Data and

4thly. From a Circumstance on which we deem it necessary to lay particular Stress, namely, that even according to the evidence of Connolly, the deceased must have actually expired previously to the possible Arrival, under the Circumstances of the Case, of any Medical Assistance.

We have carefully examined PATRICK DOYLE and JAMES BENNETT, the parties said by Connolly to have laboured under Attacks of Apoplexy or Epilepsy: and are of Opinion that James Bennett's could not have been a case of either Apoplexy or Epilepsy but was one of a Fever attended with Delirium: and that of Patrick Doyle a case

Correspondence.

THE ANTIBODY TITRE IN MATERNAL AND INFANT'S SERUM AS AN INDICATION FOR TREATMENT IN HÆMOLYTIC DISEASES OF THE NEWBORN.

SIR: I have read with amazement, as I am sure have many other obstetricians in the eastern States, the conclusions which G. A. Kelsall and G. H. Vos claim to have reached as a result of their management of a series of 43 iso-immunized Rh-negative mothers at the King Edward Memorial Hospital, Perth, Western Australia.

In their article entitled "The Antibody Titre in Maternal and Infant's Serum as an Indication for Treatment in Hæmolytic Disease of the Newborn" (March 15, 1952), they claim that a standardized direct and indirect antiglobulin test employed in this very small series has provided them with an instrument which they believe can "accurately" forecast the severity of the disease to be expected in hæmolytic disease of the newborn. Their 43 cases are neatly collected into four clinical groups according to the maternal titre. In Group III (severe cases of hæmolytic diseases, in which maternal antibody titres varied from 64 to 2048) they present 20 cases. As a result of the management of these 20 cases, they claim to have the authority to state:

It seems apparent that the severity of the disease can be forecast to some degree by the antibody titre in the mother's serum at the time of delivery . . . if it is high (1024 to 2048) the infant will probably be still-born if allowed to go to term, or it may be born alive and die soon after birth unless drastic treatment is instituted. It may die even in spite of drastic treatment. . . . In the low titre cases . . . the infants made uninterrupted recoveries. Exchange transfusions in the severe cases brought the titre down to lower levels, but in spite of this, the persistence of antibodies ranged from two to ninety-one days, depending upon the infant's initial titre. On these grounds we strongly advocate the termination of pregnancy if gestation has progressed beyond thirty-six weeks and the maternal titre is high or rising. One must balance the hazards of prematurity against those of allowing the infant to continue to term in an environment of potent antibodies. . . . Not only in this series, but among patients previously treated, we have not seen a case of mental defectiveness in a surviving infant who had been adequately treated by exchange transfusion; however, we have seen this occur in babies who were either left untreated or treated by simple transfusion alone.

(Records of 17 exchange transfusions are presented, the technique used being that in which blood is given by the saphenous vein and removed from the radial artery.) In conclusion, the authors claim that:

The answer to the problem appears to be that some infants require exchange transfusion, some simple transfusion and some no treatment at all, each case being judged on its individual merits, as determined by titration.

¹ From the original in the Mitchell Library, Sydney.

1952

jeant

ory.

been
than
The
the
board,
have
com-
the
that

AY.

NT'S
IN

many
sions
ched
iso-
ward

ernal
in
they
bulin
them
tely"
emo-
eatly
ernal
s, in
they
these

sease
re in
it is
still-
alive
nt is
reat-
made
n the
evels,
nged
the
ongly
has
ernal
zards
nt to
anti-
lents
ental
been
ever,
left

the
the
In

some
mple
case
d by

As a result of information gained from investigations which are being carried out on a series of iso-immunized Rh-negative mothers in the professional unit at the Women's Hospital, Melbourne, I believe that the above statements of Dr. Kelsall and Dr. Vos are incorrect, are based on inconclusive evidence and are misleading to medical practitioners who are readers of THE MEDICAL JOURNAL OF AUSTRALIA. Our series of cases, which will not be published for some time, has indicated to us so far that no definite forecast can be made as to the severity of the disease from the antibody titre alone, even when the antiglobulin test is used as a routine procedure.

Indications for an exchange transfusion in our hospital are not determined by titration alone, the greatest importance being attached to the infant's cord blood haemoglobin value, and the previous history. The technique employed for these transfusions is that involving transfusion through a polythene catheter inserted into the umbilical vein. The main object of our research programme is not so much to cut down the stillbirth rate, which most clinics now accept as inevitable, but to cut down the foetal mortality rate in the live births and above all, to prevent brain damage in the survivors. It is questionable whether early induction of labour is ever justifiable in these immunized mothers. The baby who will "be stillborn if allowed to go to term" will always die soon after birth if induced at thirty-six to thirty-eight weeks despite drastic action. On the other hand we now believe that it is possible that early induction is detrimental to the "live born" baby from the point of view of possible brain damage if labour is induced early. This view is very forcibly expressed in an article by Diamond and his associates in *Pediatrics*, Volume VI, 1950, in which they present the results of a detailed study of 340 cases of *erythroblastosis foetalis* seen at the Boston Lying-In Hospital and the Children's Hospital, Boston, in the years 1945-1948. These research workers have produced a later article in *The New England Journal of Medicine*, January 11, 1951, in which they present the results of 391 attempted exchange transfusions.

Yours, etc.,

J. GRANTLEY SHELTON, M.B., B.S.,
M.R.C.O.G.

The Women's Hospital,
Swanston Street,
Carlton, N.3,
Victoria.
March 19, 1952.

SURGERY OF THE ADRENAL GLANDS.

SIR: In reply to Dr. K. S. Harrison's letter in THE MEDICAL JOURNAL OF AUSTRALIA of March 22, 1952, page 420, may I state that what Dr. Harrison referred to as my "apparent advocacy of partial adrenalectomy for the patient with hirsutism and mild virilism" is quite a definite advocacy of this operation in such patients who are between puberty and the menopause, who are psychologically very upset by the hirsuties, and who are unable to accept shaving as the alternative method of control of the hirsuties. The main objection to hirsuties is, of course, the cosmetic defect *plus* the loss of femininity; and the adoption of shaving tends to confirm the latter. Dr. Harrison states that "in most endocrine clinics it is thought unjustifiable to operate on this type of patient in order to achieve a dubious cosmetic result". Against that, this is not the opinion of most of these unfortunate patients nor of all endocrine clinics. Patients so afflicted are quite willing to undergo operation in the hope that they will be in the group, which incidentally is by no means small, in whom the results, instead of being "dubious", are most gratifying.

Since there are many gaps in our knowledge of Cushing's syndrome and of other lesions of the adrenal cortex, Dr. G. Read in a letter to THE MEDICAL JOURNAL OF AUSTRALIA of March 22, 1952, page 420, is of the opinion that surgical procedures are not justifiable in Cushing's syndrome. However, there are many reports in the literature of such operations being successful, and Dr. Read is with the minority in his opinion. Other methods of treatment have little to offer these patients, and to refuse them operation is to deny them any hope of improvement or of cure. On the other hand, Dr. Harrison agrees that the risk of operation is probably justified in the treatment of Cushing's syndrome.

The psychological readjustment of the patients with hirsuties and mild virilism is unlikely if they are denied treatment, however empirical this may be considered because of gaps in our knowledge. No matter how efficient the

psychologist, he will have difficulty in persuading the patient to ignore the hirsuties. The suggestion to such patients that they shave will not help such readjustment. If the patient is willing to shave, this will overcome some of her difficulties, but I presume it is not suggested that she shaves her chest.

Operations for the removal of hormone-secreting adrenal tumours are certainly hazardous because of the frequency of post-operative reactions; but in patients so afflicted treatment is urgently required and there is no alternative to operation. In the other patients with hirsuties and only mild virilism, post-operative reactions do not occur, and the operation is hazardous only if the anaesthetic is poorly given or if the surgeon is likely to tear a hole in the inferior vena cava, duodenum *et cetera*. As an example of the safety of operations in this group of patients, may I quote Broster's series (1947) of over 100 cases without any serious complication or fatality.

Technically, operations on the adrenal glands are comparable with the operation of lumbar sympathectomy, which formerly was also considered rather hazardous, but which has become accepted even by the physicians as being almost devoid of risk in experienced hands.

Yours, etc.,

EDWARD WILSON.

159 Macquarie Street,
Sydney,
March 24, 1952.

Reference.

Broster, L. R. (1947), "Adrenal Glands", in "British Surgical Practice", Volume I, edited by E. Rock Carling and J. Paterson Ross, page 94.

DERMATITIS APPARENTLY CAUSED BY A STAPHYLINID BEETLE IN AUSTRALIA.

SIR: In your issue of December 8, 1951, Mr. K. C. McKeown, F.R.Z.S., reported on a dermatitis apparently caused by a staphylinid beetle in Australia, brought to his notice, with specimen of *Pederus cruenticollis*, on December 22, 1950, by Mr. P. T. Millard, F.R.C.S. (Edinburgh), of Wagga Wagga, New South Wales.

I had seen several similar cases about one year ago, and thought them due to insects. Following a very wet season in Mt. Isa insects of many types were then most plentiful. I cannot recall if they included beetles of the description given, nor have I noticed any such since reading the report.

The lesions were more often on limbs than suggested by Mr. Millard's description, but we probably expose more skin in Mt. Isa than in Wagga Wagga. They healed in about four days: in my own case with very mild scabbing after no attention other than scarification in an unsuccessful attempt to culture organisms.

I have failed to find many cases in a short search of my records. In the six weeks from January 1, 1951, at Mineside Clinic there were 246 "new cases"; these include 19 all cases skin affections, of which two only were of this lesion, and one of these and two others had common types of reactions to insect bites. My colleagues on the Townside cannot recall any cases. This "wet" has been persistently hot and dry, insects have been few, prickly heat common: I have seen only one case vaguely resembling this lesion.

Yours, etc.,

BRIAN JOYCE.

Mineside,
Mt. Isa,
North-West Queensland.
March 21, 1952.

THE MOVABLE EYE IMPLANT: A DESCRIPTION OF THE IMPLANT TECHNIQUE USING THE CUTLER-HAMBLIN PROSTHESIS.

SIR: I would like to express my appreciation of Dr. John Bignell's article on "The Movable Eye Implant" (THE MEDICAL JOURNAL OF AUSTRALIA, March 15, 1952). The descriptions of his technique should be very helpful. However, from his account, the impression is gained that these implants almost always give perfect cosmetic appearances

and few complications. I am sure that if Dr. Bignell had been able to follow his patients for longer periods, complications would have given him considerable worry. No results from prolonged observations have been published from British countries, but from the United States of America where orbital implants have been used for several years, reports list numerous complications—particularly extrusion and copious discharge. Although the American implants contain acrylic with the tantalum mesh, the behaviour of tantalum elsewhere in the body does not suggest that the all-tantalum implants are likely to be free of granuloma formation with its unfavourable consequences. The complications associated with exposure of part of the implant have been considered too great by many leading American ophthalmologists, who have discontinued such complicated implants and have concentrated on developing totally buried implants.

The whole subject of orbital implants must be considered to be still in the experimental stage. Melbourne is fortunate in possessing artificial eye makers who can construct different types of implants. It is hoped to try various patterns at the Victorian Eye and Ear Hospital and continue the observations required in this field.

82 Collins Street,
Melbourne,
March 20, 1952.

Yours, etc.,
RONALD LOWE.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 22, of March 13, 1952.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Resignation.—The resignation of Patrick Raymond Joyce as Surgeon Lieutenant (for short service) is accepted, dated 30th November, 1951.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Volunteer Reserve.

Appointment.—Ronald Keith Smyth is appointed Surgeon Lieutenant, with seniority in rank of 22nd August, 1949, dated 4th January, 1952.

AUSTRALIAN MILITARY FORCES.

Honours and Awards.

The Australian Efficiency Decoration.

6/15311 Lieutenant-Colonel (Temporary Colonel) Peter Braithwaite, Royal Australian Army Medical Corps, Lieutenant-Colonels 1/24896 Charles Cecil Francis Bourne, D.S.O., 26th Infantry Battalion, and 3/51010 Roy Bryant Maynard, Royal Australian Army Medical Corps.

Australian Regular Army.

Royal Australian Army Medical Corps.

To be Captain, 26th November, 1951, with Short Service Commission for a Period of One Year.—2/40112 Malcolm James Deakin (Captain).

Royal Australian Army Medical Corps.

The following officers relinquish the provisional rank of Captain and are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (1st Military District), in the honorary rank of Captain, 15th January, 1952: QX700131 I. S. Holle and QX700132 B. S. Pursey.

VX700229 Captain (provisionally) B. C. A. Stratford relinquishes the provisional rank of Captain and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (3rd Military District) in the honorary rank of Captain, 25th December, 1951.

To be Captains.—NX700345 Robert Steve Edgley, 9th January, 1952, and VX700258 Michael Nicholas Lolagis, 29th January, 1952.

QX700130 Captain (provisionally) J. L. Jameson is transferred from the Citizen Military Forces, 17th December, 1951.

The following officers are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical))

(3rd Military District) in rank of Honorary Captain: Captains (provisionally) VX700227 J. N. McNicol, 24th December, 1951, and VX700228 J. H. Leyden, 28th December, 1951. To be Captain (provisionally), 2nd January, 1952: WX700133 Kevin Owen McRae Fitzpatrick. To be Temporary Major, 18th January, 1952: 2/40068 Captain E. G. H. Manchester.

Citizen Military Forces.

Northern Command: First Military District.

Royal Australian Army Medical Corps (Medical).—1/46775 Captain (provisionally) J. L. Jameson is transferred to the Interim Army, 17th December, 1951.

Eastern Command: Second Military District.

Royal Australian Army Medical Corps.—2/96519 Major F. D. M. Williams is absorbed within a vacancy in the authorized establishment of Majors and to receive pay and allowances of that rank, and is transferred to 7th/21st Australian Horse Divisional Regiment, 7th October, 1951. To be Major, 31st January, 1952: 2/146556 Captain A. G. Finley.

Royal Australian Army Medical Corps.—2/127024 Honorary Captain D. C. Maddison is appointed from the Reserve of Officers, and to be Captain (provisionally), 29th December, 1951. The following officers are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (2nd Military District): Majors 2/50013 T. M. Clouston, 22nd November, 1951, and 2/50012 R. R. Winton, 10th December, 1951. The following officers relinquish the provisional rank of Captain and are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (2nd Military District) in the honorary rank of Captain: 2/127806 E. J. Fitzsimons, 9th November, 1951, and 2/56833 B. S. Hartnett, 29th November, 1951. To be Captains (provisionally): 2/130100 Max William Guymer, 2/130102 John Justinian Byrne and 2/130103 Bruce Wesley Noake, 8th January, 1952, and 2/61547 Sydney John Iceton, 16th January, 1952.

Southern Command: Third Military District.

Royal Australian Army Medical Corps.—3/101808 Captain (provisionally) R. E. Seal relinquishes the provisional rank of Captain and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (3rd Military District) in the honorary rank of Captain, 31st December, 1951. To be Major (provisionally), 19th December, 1951: 3/77537 Captain G. G. Harkness.

Central Command: Fourth Military District.

Royal Australian Army Medical Corps.—4/31952 Captain R. A. Kenihan is seconded for post-graduate studies in the United Kingdom, 29th November, 1951. 4/35233 Major J. D. Rice is absorbed within a vacancy in the authorized establishment of Majors and to receive pay and allowances of that rank, 4th January, 1952.

Royal Australian Army Medical Corps.—4/31901 Lieutenant-Colonel R. G. Champion de Crespigny relinquishes command 3rd Field Ambulance, and is appointed to command 1st Casualty Clearing Station, 18th January, 1952. 4/31903 Major C. M. Gurner is appointed to command 3rd Field Ambulance, and to be Lieutenant-Colonel (provisionally), 18th January, 1952.

Western Command: Fifth Military District.

Royal Australian Army Medical Corps.—5/26459 Captain (provisionally) V. T. White is seconded whilst undergoing post-graduate studies in United Kingdom, 15th August, 1951. The provisional appointment of 5/26459 Captain V. T. White is terminated, 18th December, 1951. To be Captain (provisionally), 19th December, 1951: 5/26459 Victor Thompson White, with regimental seniority next after 5/26429 Captain (provisionally) K. W. H. Harris. 5/26459 Captain (provisionally) V. T. White is seconded whilst undergoing post-graduate studies in United Kingdom, 19th December, 1951.

Tasmania Command: Sixth Military District.

Royal Australian Army Medical Corps: To be Captain (provisionally), 30th January, 1952.—6/15233 Karl George Ball.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

1st Military District: To be Honorary Captains.—Wyllie David Gibbons, 10th January, 1952, and John Howard Wilfred Wagner, 16th January, 1952.

2nd Military District: To be Major, 14th January, 1952.—Stanley Percy Bellmaine.

5th Military District.—The resignation of Major W. J. E. Phillips of his commission is accepted, 4th January, 1952.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Course in Occupational Medicine.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that in conjunction with the School of Public Health and Tropical Medicine, a course in occupational medicine will be conducted from May 26 to June 3, 1952, under the supervision of Dr. Gordon Smith. It will consist of a series of lecture-discussions at the School of Public Health and Tropical Medicine and several factory excursions. The course will be suitable for general practitioners and others interested in occupational medicine. Fee for attendance will be £1 1s. Medical practitioners who wish to attend the course should apply before April 28, 1952, to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Erby, Robert James George, M.B., B.S., 1951 (Univ. Sydney), Cessnock District Hospital, Cessnock, New South Wales.

Langsford, William Andrew, M.B., B.S., 1952 (Univ. Sydney), Darwin Hospital, Darwin, Northern Territory.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association: Barton, David Edmund, provisional registration M.B.,

1952 (Univ. Sydney); Bennett, James Warren Bruce, provisional registration M.B., 1952 (Univ. Sydney); Bernays, Geoffrey King, provisional registration M.B., 1952 (Univ. Sydney); Brown, Richard Francis, provisional registration M.B., 1952 (Univ. Sydney); Bruce, Douglas William, provisional registration M.B., 1952 (Univ. Sydney); Bryce, Beverley Wynifred, provisional registration M.B., 1952 (Univ. Sydney); Burns, David, provisional registration M.B., 1952 (Univ. Sydney); Campbell, Donald McLeod, provisional registration M.B., 1952 (Univ. Sydney); Chalmers, Clair Drummond, provisional registration M.B., 1952 (Univ. Sydney); Clarence, Leslie Norman, provisional registration M.B., 1952 (Univ. Sydney); Cordingley, John Louis, provisional registration M.B., 1952 (Univ. Sydney); Cornfield, William Harry, provisional registration M.B., 1952 (Univ. Sydney); Croll, Francis James Thomas, provisional registration M.B., 1952 (Univ. Sydney); Dash, Edward Geoffrey, provisional registration M.B., 1952 (Univ. Sydney); de Meyrick, George William, provisional registration M.B., 1952 (Univ. Sydney); Dodd, Grahame Powis, provisional registration M.B., 1952 (Univ. Sydney); Drummond, Norman Cranmer, provisional registration M.B., 1952 (Univ. Sydney); Edwards, Ian Swales, provisional registration M.B., 1952 (Univ. Sydney); Evans, Patricia Isobel, provisional registration M.B., 1952 (Univ. Sydney); Findlay, James Scott, provisional registration M.B., 1952 (Univ. Sydney); Flynn, Michael John, provisional registration M.B., 1952 (Univ. Sydney); Francis, Peter Newton, provisional registration M.B., 1952 (Univ. Sydney); Glass, Julian Bernard, provisional registration M.B., 1952 (Univ. Sydney); Goulston, Roy Frank, provisional registration M.B., 1952 (Univ. Sydney); Green, Betty Florence, provisional registration M.B., 1952 (Univ. Sydney); Halliday, George Macanish, provisional registration M.B., 1952 (Univ. Sydney); Hassall, John Everard, provisional registration M.B., 1952 (Univ. Sydney); Hawke, Pamela Joan, provisional registration M.B., 1952 (Univ. Sydney); Holliday, Richard Edward Henry, provisional registration M.B., 1952 (Univ. Sydney); Holliday, Una Joan, provisional registration M.B., 1952 (Univ. Sydney); Hull, Arthur David Poole, provisional registration M.B., 1952 (Univ. Sydney); Jenkins, Ronald George, provisional registration M.B., 1952 (Univ. Sydney); Kirby, John Fulford, provisional registration M.B., 1952 (Univ. Sydney);

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MARCH 22, 1952.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania. ^a	Northern Territory.	Australian Capital Territory.	Australia. ^b
Acute Rheumatism
Amoebiasis
Ancylostomiasis	2	..	..	..	..	..	2
Anthrax
Bilharziasis
Brucellosis	2(1)	1	..	..	..	..	..	3
Cholera
Chorea (St. Vitus)
Dengue
Diarrhoea (Infantile)	9(8)	..	3	..	..	..	12
Diphtheria	3	4(3)	2	1	3(1)	..	..	..	13
Dysentery (Bacillary)	4(4)	6(3)	..	6(1)	..	..	..	16
Encephalitis	1	3	..	..	..	..	..	..	4
Filariasis
Homologous Serum Jaundice
Hydatid
Infective Hepatitis	21(11)	..	1	..	22
Lead Poisoning
Leprosy	3	..	1	..	4
Leptospirosis	1	..	..	..	..	..	1
Malaria
Meningococcal Infection	3	1(1)	1	..	..	..	..	..	6
Ophthalmia
Ornithosis
Paratyphoid
Plague
Poliomyelitis	12(3)	9(3)	4(2)	28(21)	3	..	..	..	56
Puerperal Fever
Rubella	9(9)	..	..	6(1)	..	..	..	15
Salmonella Infection	1(1)	..	1	4	6
Scarlet Fever	14(5)	39(14)	2(2)	..	2(1)	9(1)	..	..	60
Smallpox
Tetanus
Trachoma
Trichinosis
Tuberculosis	60(45)	8(7)	26(17)	7(6)	19(8)	2(2)	..	..	115
Typhoid Fever	1(1)	1(1)	2(1)	..	..	..	..	..	4
Typhus (Flea-, Mite- and Tick-borne)	2(1)	..	..	..	..	..	2
Typhus (Louse-borne)
Yellow Fever

¹ Figures in parentheses are those for the metropolitan area.

Law, John Richard, provisional registration M.B., 1952 (Univ. Sydney); Lyons, William John, provisional registration M.B., 1952 (Univ. Sydney); Maegraith, Ruth Tresilian, provisional registration M.B., 1952 (Univ. Sydney); Maffesoni, Keith Ernest, provisional registration M.B., 1952 (Univ. Sydney); Marr, Donald John, provisional registration M.B., 1952 (Univ. Sydney); Matthews, Ernest, provisional registration M.B., 1952 (Univ. Sydney); Minogue, Francis John, provisional registration M.B., 1952 (Univ. Sydney); Morgan, William Andrew Distin, provisional registration M.B., 1952 (Univ. Sydney); Morris, John, provisional registration M.B., 1952 (Univ. Sydney); Morton, David Charles, provisional registration M.B., 1952 (Univ. Sydney); Nelson, Merran Mitchell, provisional registration M.B., 1952 (Univ. Sydney); Palmer, Peter Scott, provisional registration M.B., 1952 (Univ. Sydney); Parker, John Jerome, provisional registration M.B., 1952 (Univ. Sydney); Pearson, Barry Clive, provisional registration M.B., 1952 (Univ. Sydney); Pryde, Donald Lowes Ainsworth, provisional registration M.B., 1952 (Univ. Sydney); Rasmussen, Lionel Keith, provisional registration M.B., 1952 (Univ. Sydney); Reid, Robert Keith, provisional registration M.B., 1952 (Univ. Sydney); Repin, George Dimitri, provisional registration M.B., 1952 (Univ. Sydney); Shulman, Albert, provisional registration M.B., 1952 (Univ. Sydney); Solling, Michael Cecil Rex, provisional registration M.B., 1952 (Univ. Sydney); Stonham, John Alfred Milner, provisional registration M.B., 1952 (Univ. Sydney); Stump, Grahame Julian Witherington, provisional registration M.B., 1952 (Univ. Sydney); Taylor, John Morris, provisional registration M.B., 1952 (Univ. Sydney); Thompson, Arthur Richard, provisional registration M.B., 1952 (Univ. Sydney); Thompson, Harold Lindsay, provisional registration M.B., 1952 (Univ. Sydney); Thomson, Evan McKay, provisional registration M.B., 1952 (Univ. Sydney); Thurlow, Harold William, provisional registration M.B., 1952 (Univ. Sydney); Tow, Aubrey James, provisional registration M.B., 1952 (Univ. Sydney); Trousdale, Donald Henry, provisional registration M.B., 1952 (Univ. Sydney); Tunley, John Leslie, provisional registration M.B., 1952 (Univ. Sydney); Vaughan, Christian Ernest, provisional registration M.B., 1952 (Univ. Sydney); Whiteway, Donald Wallace, provisional registration M.B., 1952 (Univ. Sydney); Windon, Helen Margaret, provisional registration M.B., 1952 (Univ. Sydney); Winn, Richard William, provisional registration M.B., 1952 (Univ. Sydney); Woods, David Robert, provisional registration M.B., 1952 (Univ. Sydney); Duncan, Jewel Shirley Esther, M.B., B.S., 1946 (Univ. Sydney); Howell, David John, M.B., B.S., 1945 (Univ. Sydney); Hinds, Neville Albert, M.B., B.S., 1951 (Univ. Sydney); Low, Bruce, M.B., B.S., 1951 (Univ. Sydney); Morrissey, Matthew John, M.B., B.S., 1951 (Univ. Sydney); McGill, John Charles, M.B., B.S., 1951 (Univ. Sydney); Roach, Trevor Hunter, M.B., B.S., 1950 (Univ. Sydney); Saad, Ronald Shalhoub, M.B., B.S., 1951 (Univ. Sydney); Scarlett, Geoffrey Anthony Gerard, M.B., B.S., 1951 (Univ. Sydney); Schnitzler, George Julius, M.B., B.S., 1951 (Univ. Sydney); Walsh, John Raymond Warn, M.B., B.S., 1951 (Univ. Sydney); Ward, William John, M.B., B.S., 1951 (Univ. Sydney); Brauner, Adolf, provisional registration in accordance with *Medical Practitioners Act*, 1938-1951, Section 17 (1) (c); Frank, Derek David, provisional registration in accordance with *Medical Practitioners Act*, 1938-1951, Section 17 (1) (c); Frant, Henryk, provisional registration in accordance with *Medical Practitioners Act*, 1938-1951, Section 17 (1) (c); Listwan, Ignacy Andrew, provisional registration in accordance with *Medical Practitioners Act*, 1938-1951, Section 17 (1) (c); Rosleigh, Ronald Francis, provisional registration in accordance with *Medical Practitioners Act*, 1938-1951, Section 17 (1) (c); Sanecki, Joseph Maciej, provisional registration in accordance with *Medical Practitioners Act*, 1938-1951, Section 17 (1) (c); Turek, Moses, provisional registration in accordance with *Medical Practitioners Act*, 1938-1951, Section 17 (1) (c).

Notice.

POST-GRADUATE GOLF MATCH.

THE Post-Graduate Committee in Medicine in the University of Sydney wishes attention to be drawn to the altered date of the post-graduate golf match, which will now be played at the Royal Sydney Golf Club, Rose Bay, on Tuesday, April 29, 1952. The following are eligible to compete: (a) Post-graduate students attending the general revision course, 1952. (b) Post-graduate students who have

attended any course conducted by the committee during the previous twelve months. (c) Visiting lecturers. (d) Members of the Post-Graduate Committee in Medicine and its subcommittees. (e) Honorary medical officers and resident medical officers of hospitals participating in post-graduate work in New South Wales. (f) Teachers in the Faculty of Medicine of the University of Sydney. This includes the members of the honorary medical staffs of all clinical schools. (g) Members of the annual subscription course. Entries should be addressed to the Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Telephones: BU 5238 and BW 7483.

Diary for the Month.

- APRIL 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 APRIL 22.—New South Wales Branch, B.M.A.: Ethics Committee.
 APRIL 23.—Victorian Branch, B.M.A.: Council Meeting.
 APRIL 24.—New South Wales Branch, B.M.A.: Branch Meeting.
 APRIL 24.—South Australian Branch, B.M.A.: Listerian Oration.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 per annum within Australia and the British Commonwealth of Nations, and £6 10s. per annum within America and foreign countries, payable in advance.

ing
(d)
and
esi-
st-
the
his
all
ion
ate
ey.

tics
om-

ng.
ian

re.

any
ted
ith
on,

rie
in

all,
ed;
tial
cal
nal
ut-

225
ted
cal
and
RY
in
to

rth
in

int
act
rn-
the

not
or-
HE
be

HE
ner
2.)
ger,
be,
the
any
ript
one

not
of
ion
by
ok-
any
ft
of
ign